BMS302

Lab 1
Eye & Ear

Prof. dr. Manal Shaaban

Faculty of Medicine, Fall 2025
Galala University

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Intended Learning Outcomes

By the end of this lecture, you should be able to:

1. **Identify structure of the cornea by L.M.**
2. **Identify the corneoscleral junction by L.M.**
3. **Identify the layers of the retina by L.M.**
4. **Identify the layers of the retina in E.M photos**

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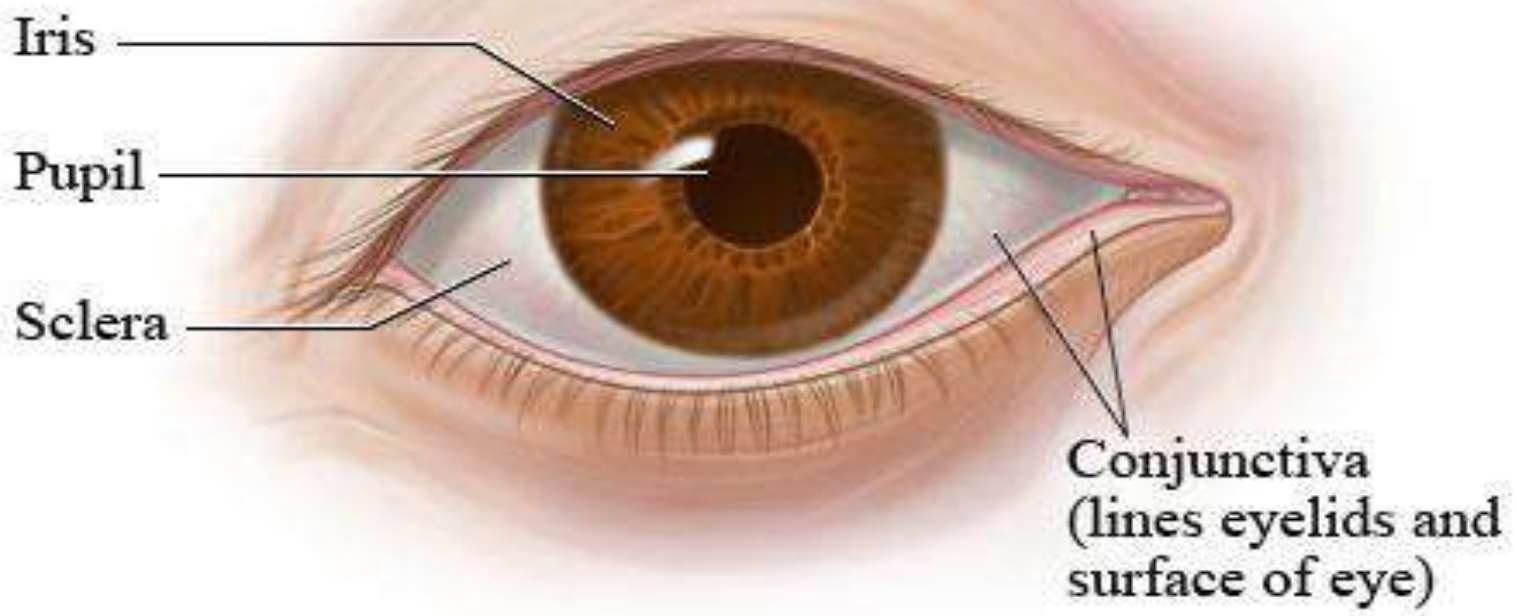
Intended Learning Outcomes

By the end of this lecture, you should be able to:

1. **Describe the structure of the cochlear duct and organ of corti.**
2. **Describe the structure of Maculae and Cristea ampularis.**
3. **Identify SEM picture of the hair cells of organ of corti.**


Iris
Pupil
Sclera
Conjunctiva
(lines eyelids and
surface of eye)

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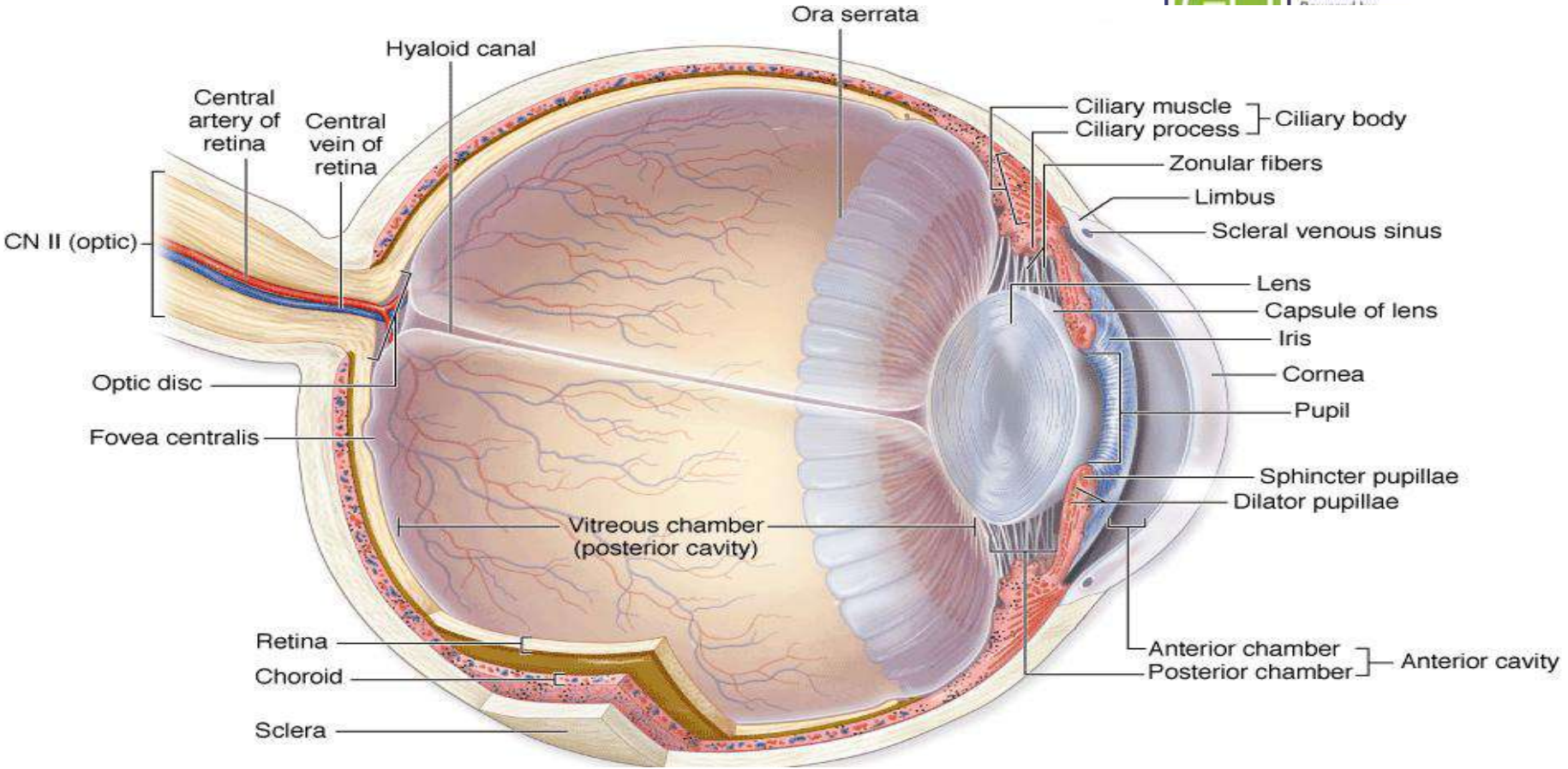
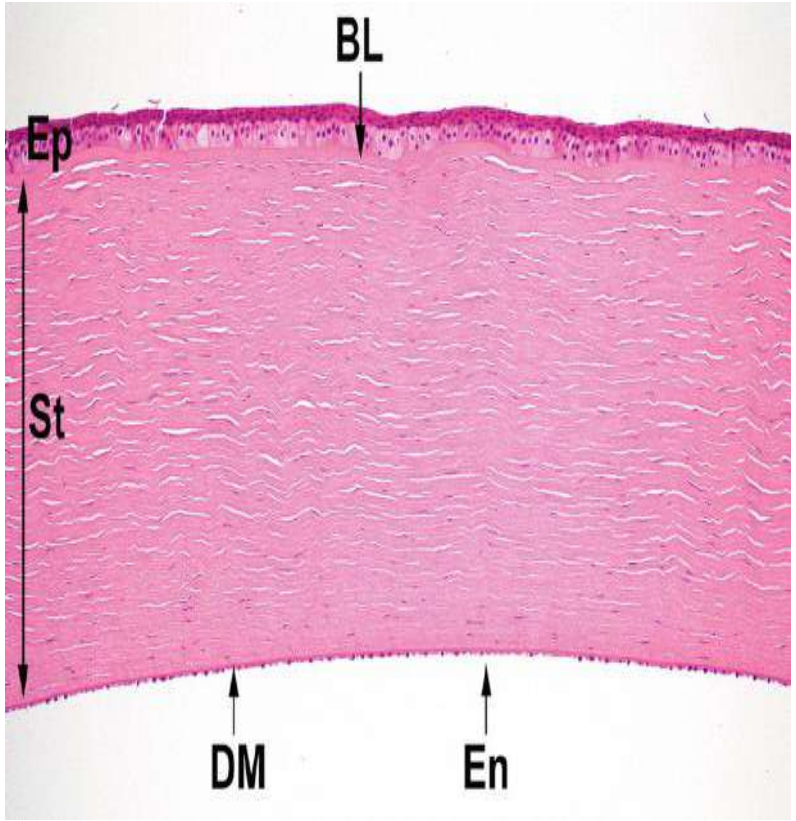
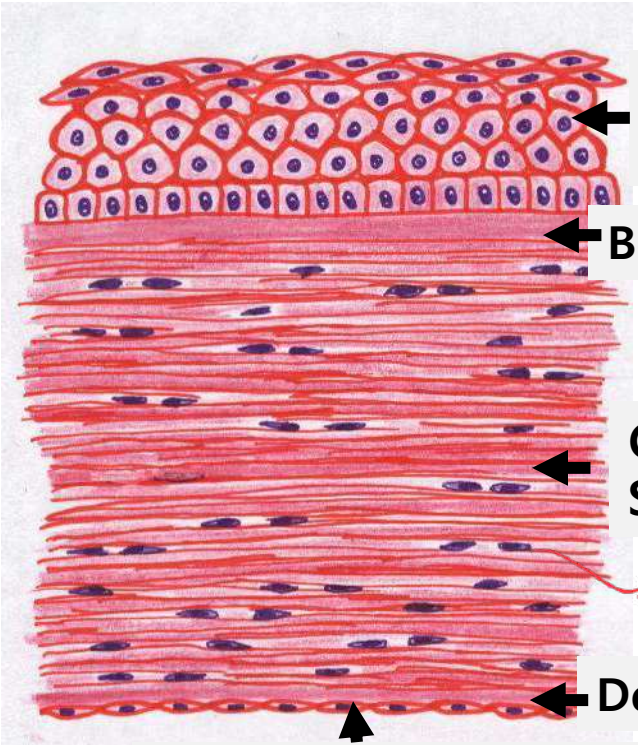


cornea





Corneal epithelium
St.sq.non kert.

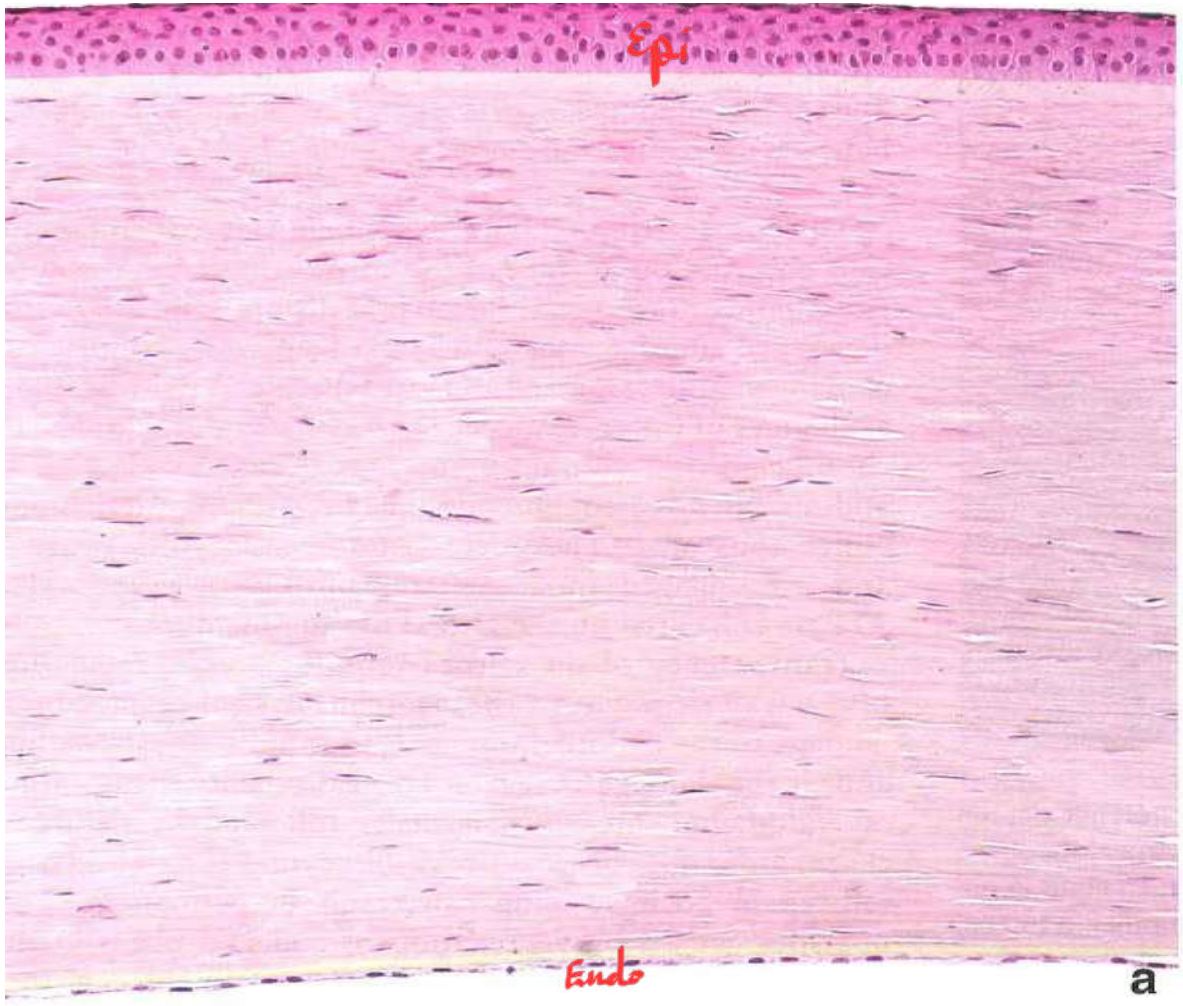
Bowman's membrane

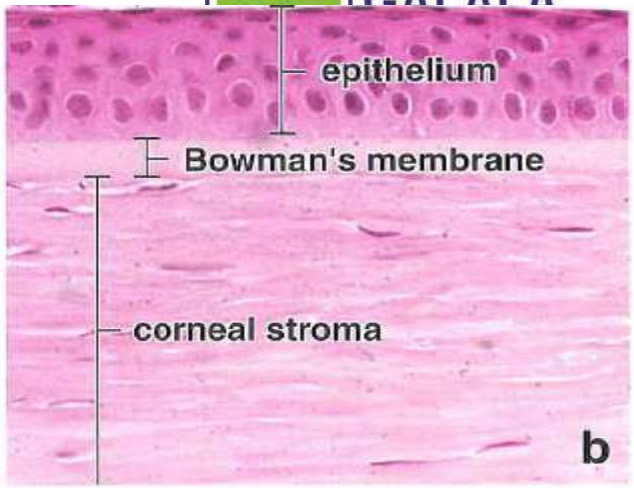
Corneal stroma
Substantia propria

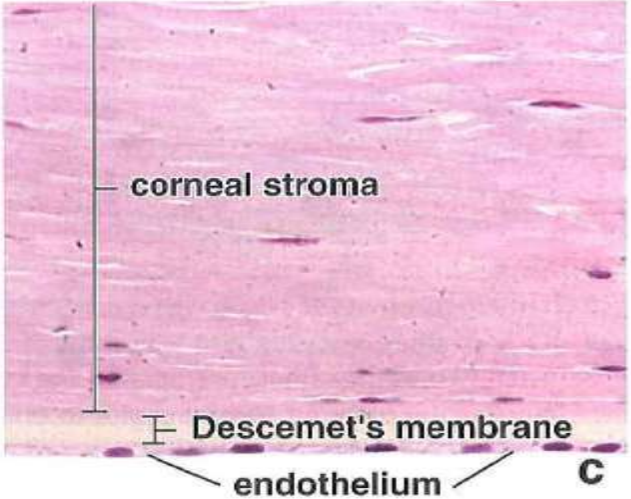
fibroblast for Collagen

Descemet's membrane

Descemet's endothelium

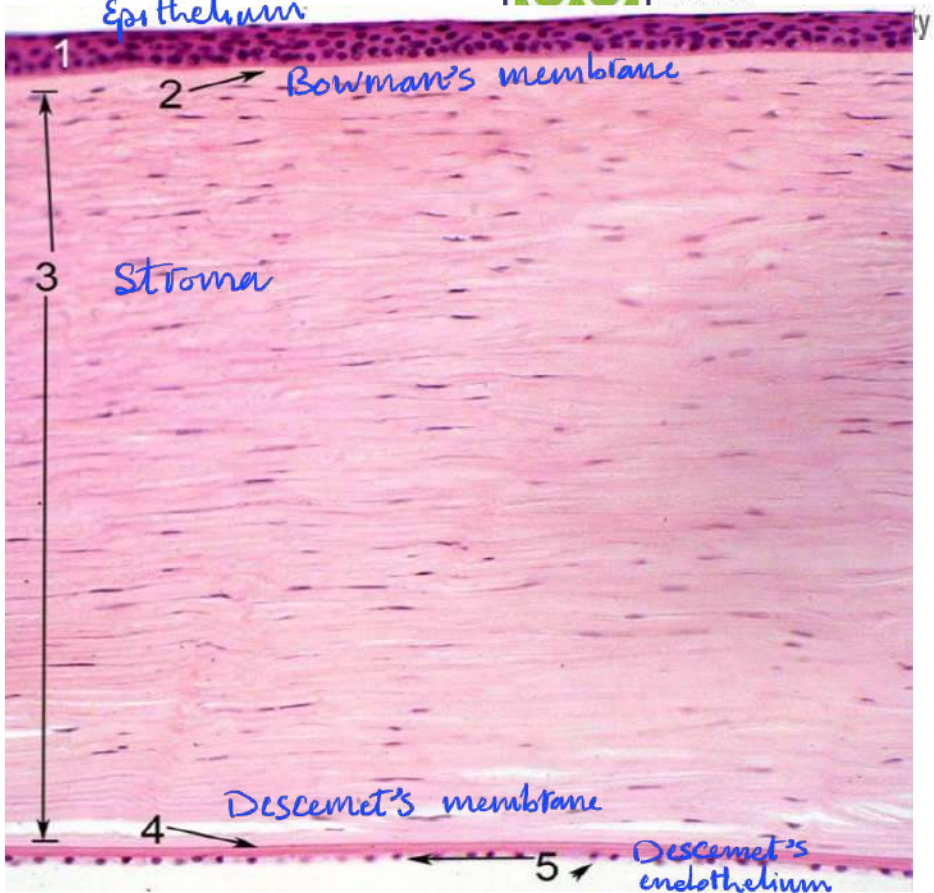

Epi
Endo
a


epithelium
Bowman's membrane
corneal stroma
b

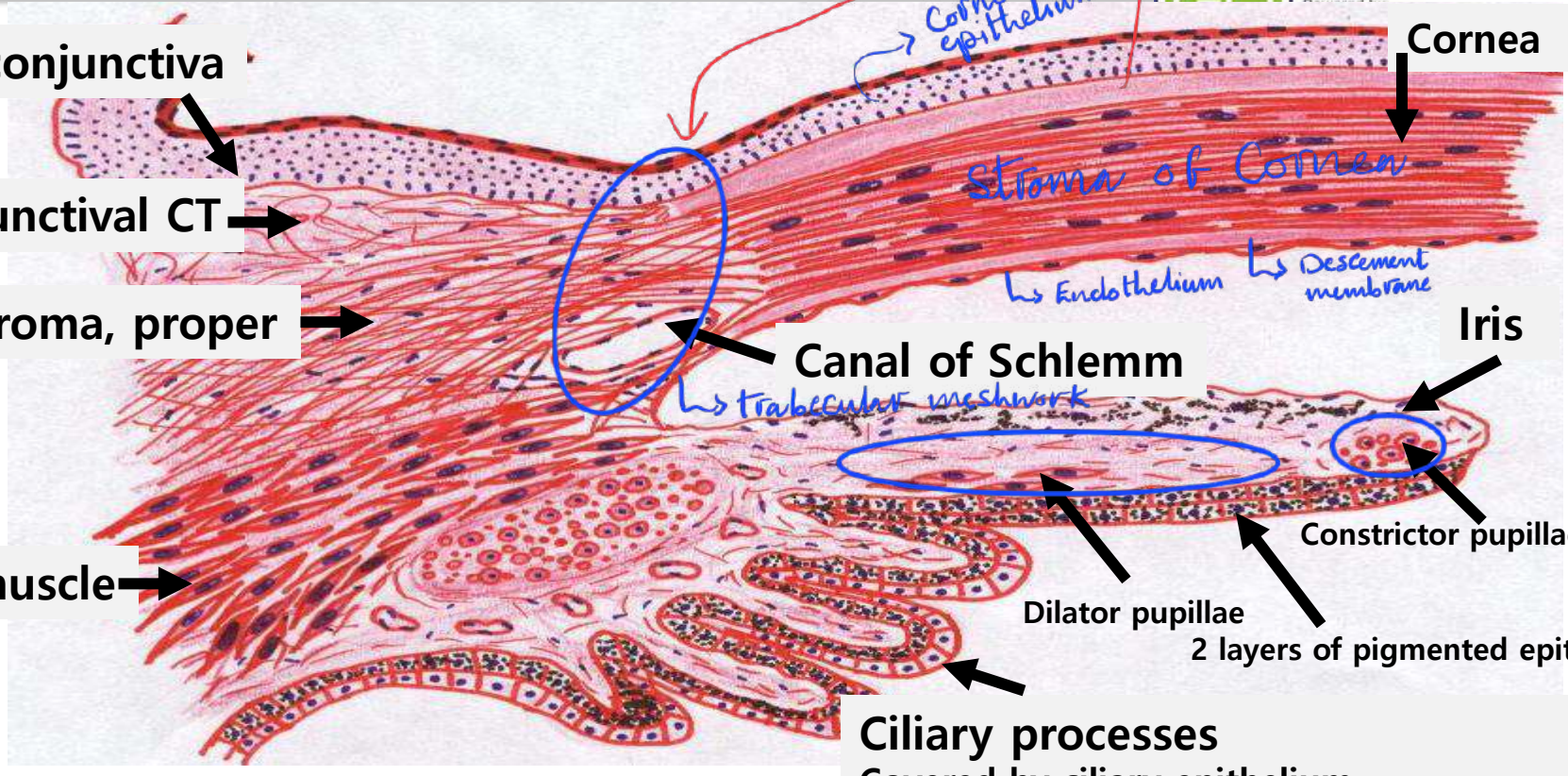

corneal stroma
Descemet's membrane
endothelium
c

cornea

Stroma
Ep
Endo


Epithelium
1
2
Bowman's membrane
3
Stroma
Descemet's membrane
4
5
Descemet's endothelium

corneoscleral junction= Limbus



Ciliary processes
Covered by ciliary epithelium,
outer pigmented & inner non pigmented

Conjunctiva & sclera

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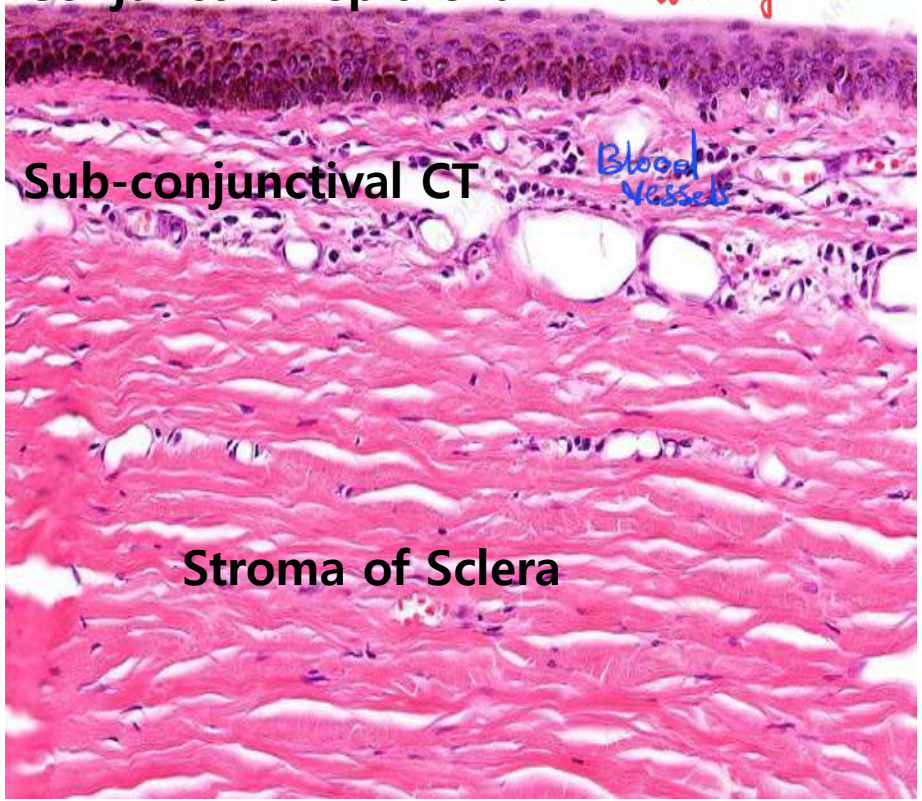
Conjunctival epithelium → stratified columnar epi with goblet cells

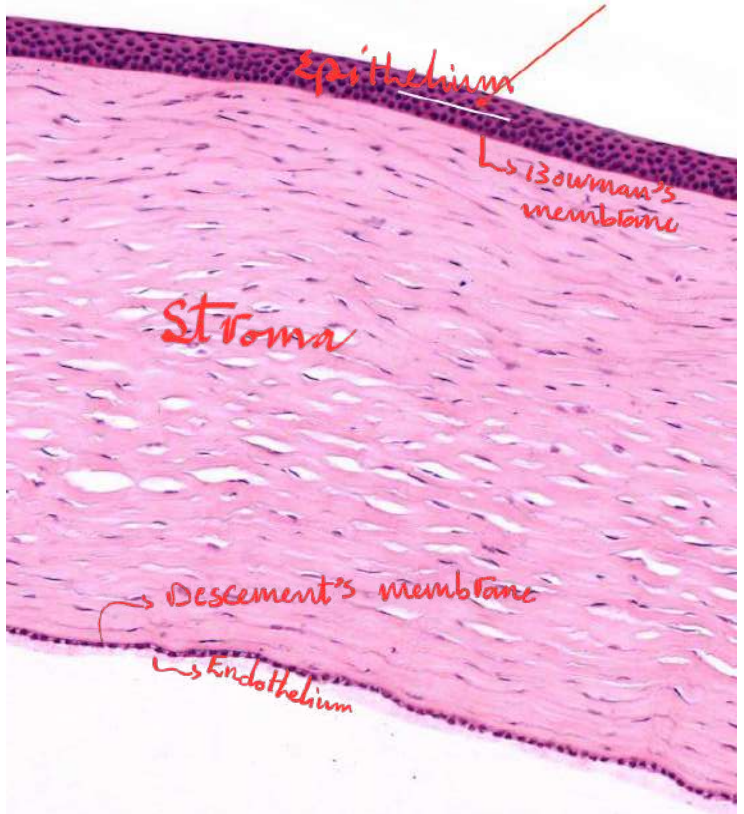
Sub-conjunctival CT

Blood vessels

Stroma of Sclera



Cornea



Corneoscleral junction= Limbus

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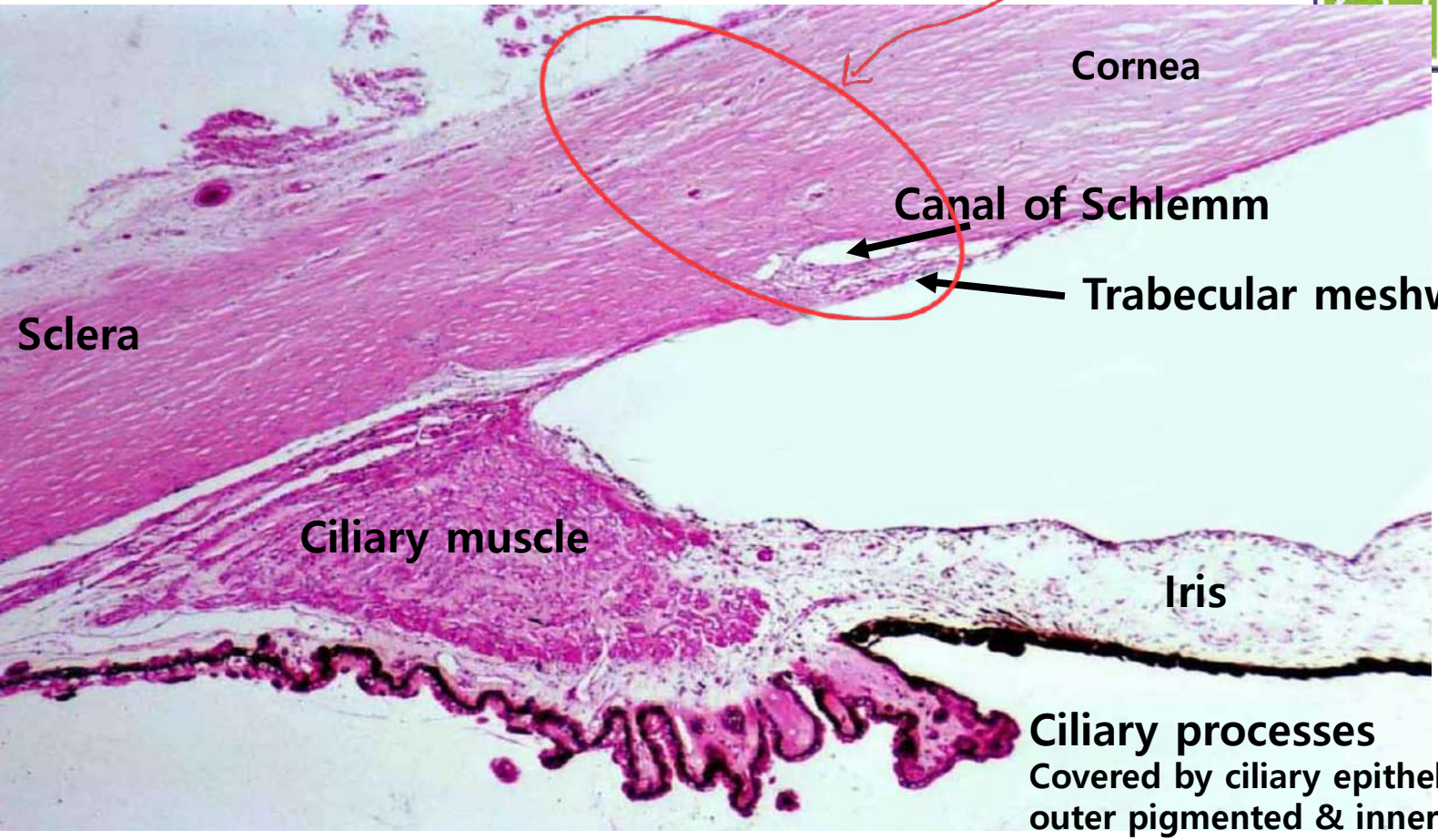
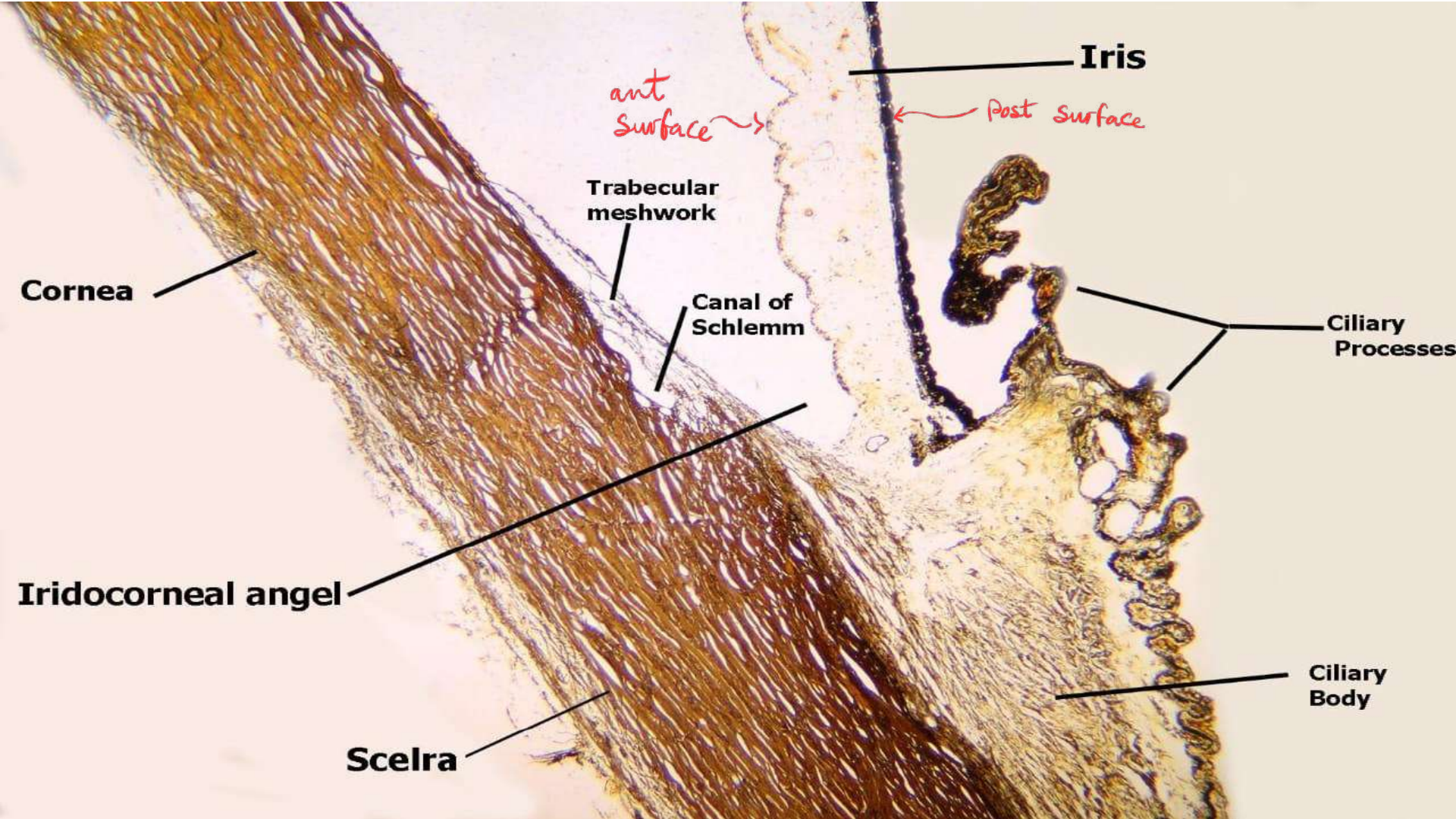


Ciliary processes
Covered by ciliary epithelium,
outer pigmented & inner non pigmented


Iris
ant surface
Post surface
Trabecular meshwork
Cornea
Canal of Schlemm
Ciliary Processes
Iridocorneal angel
Ciliary Body
Scelra

Iris

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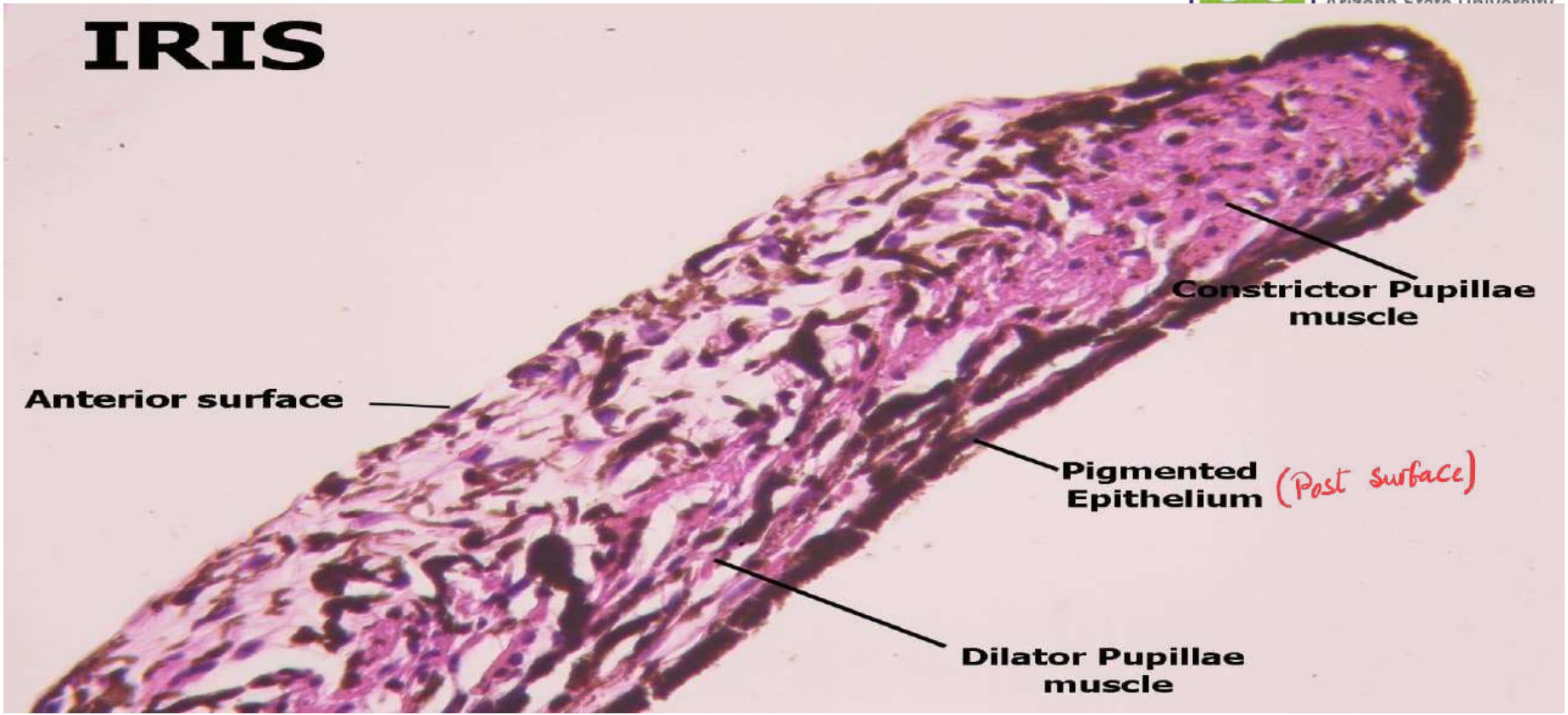
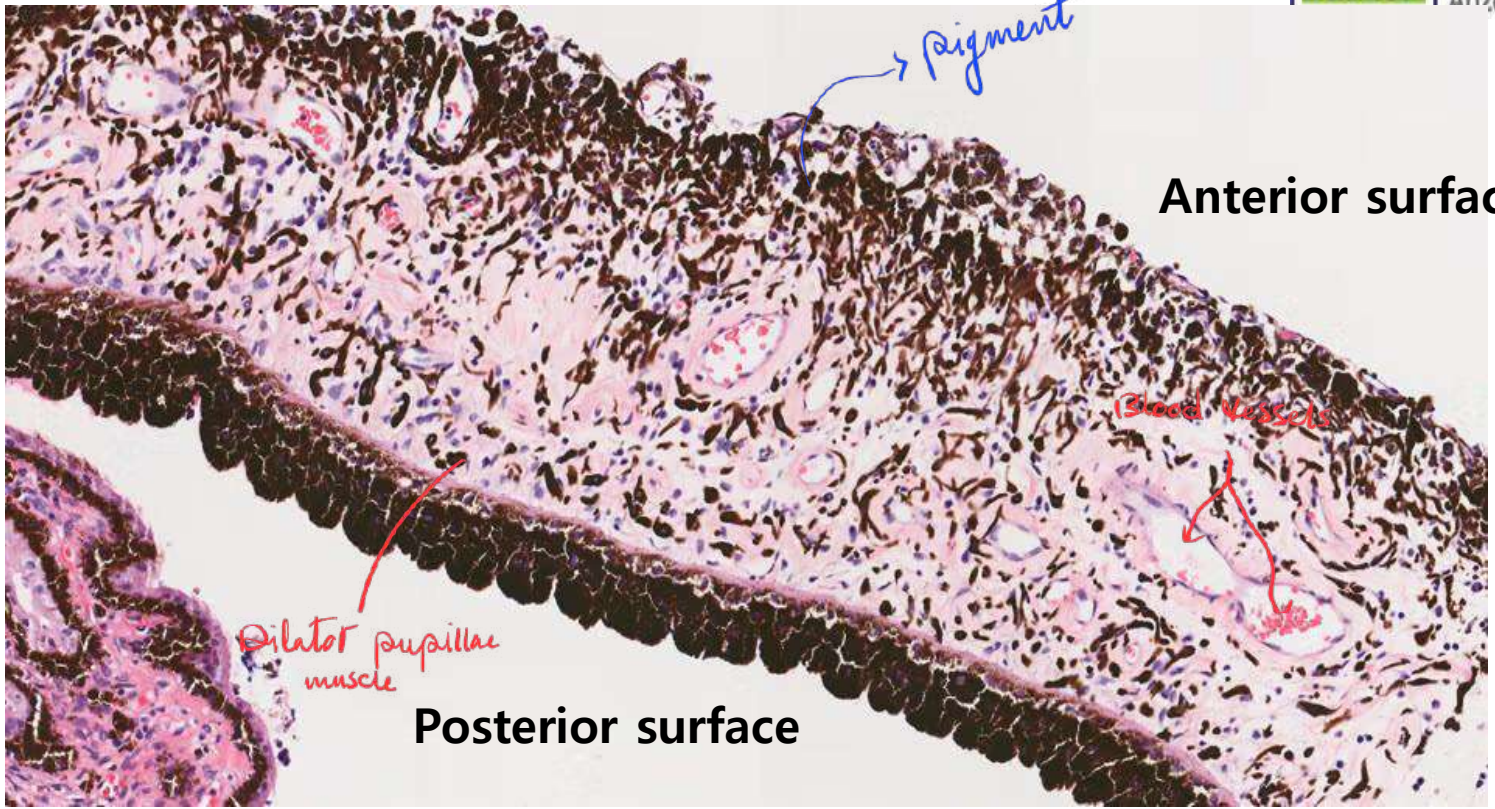


Iris


Pigment
Anterior surface
Blood vessels
Dilator pupillae muscle
Posterior surface

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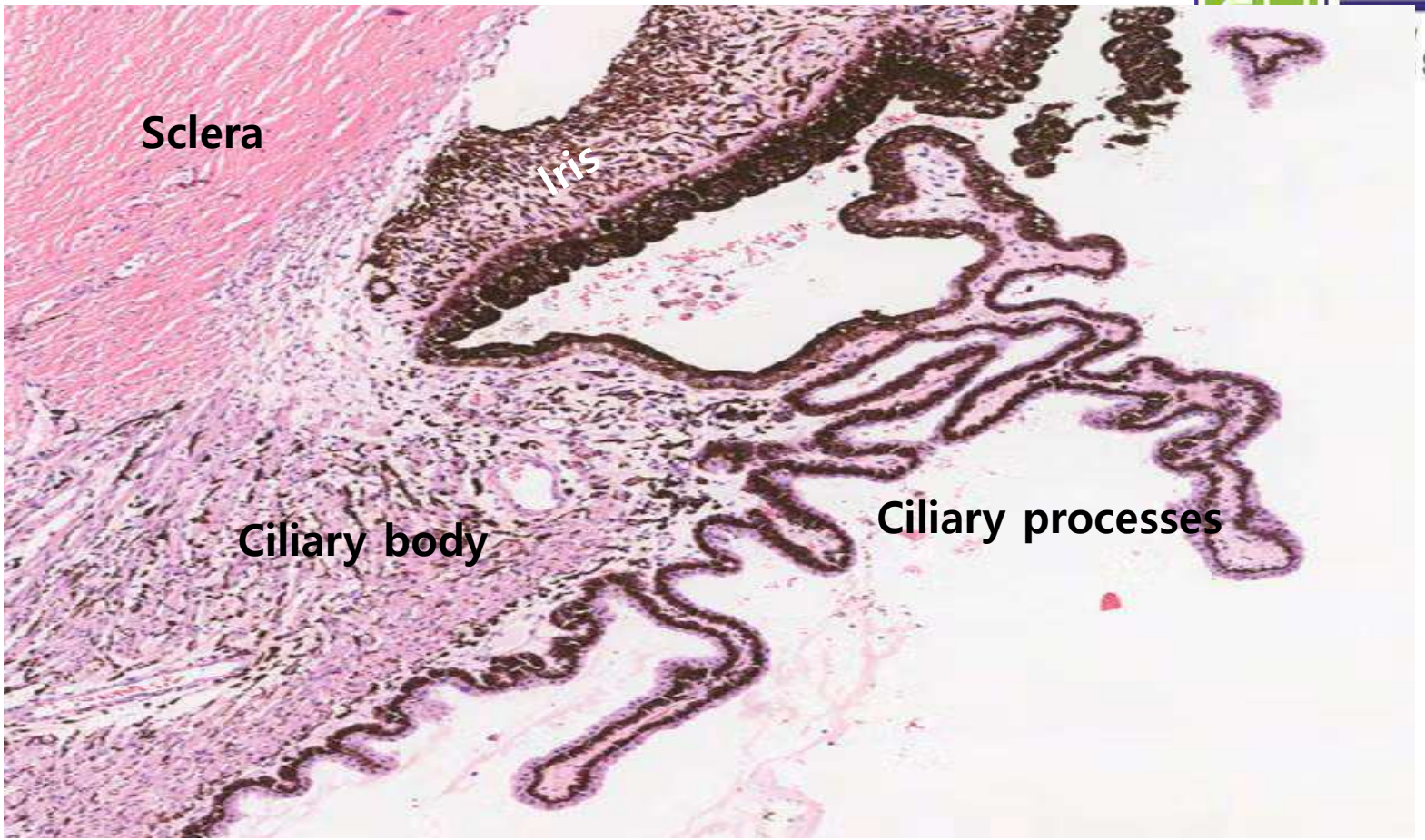

Lens

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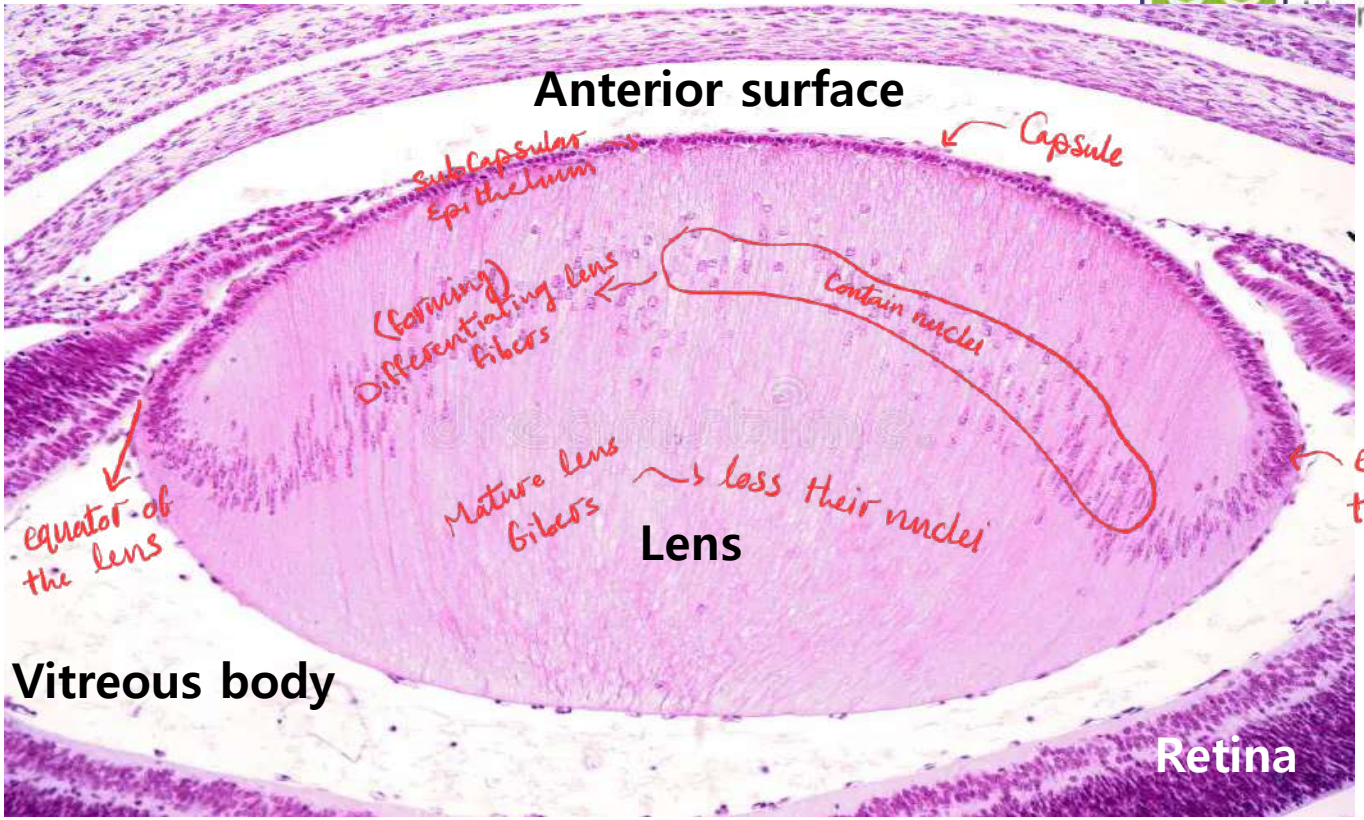

Lens

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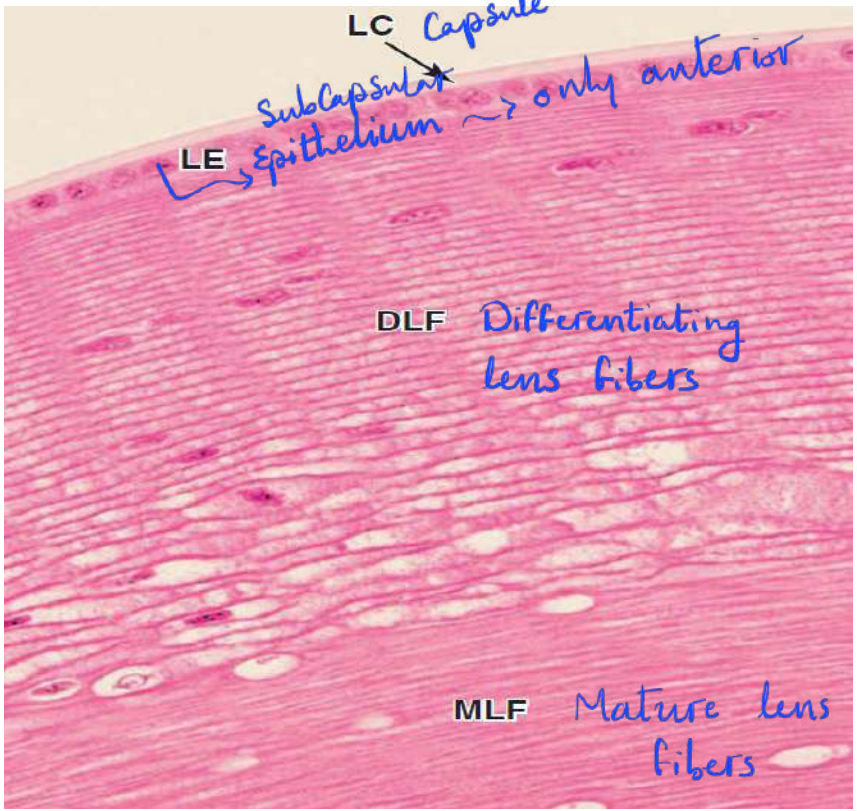

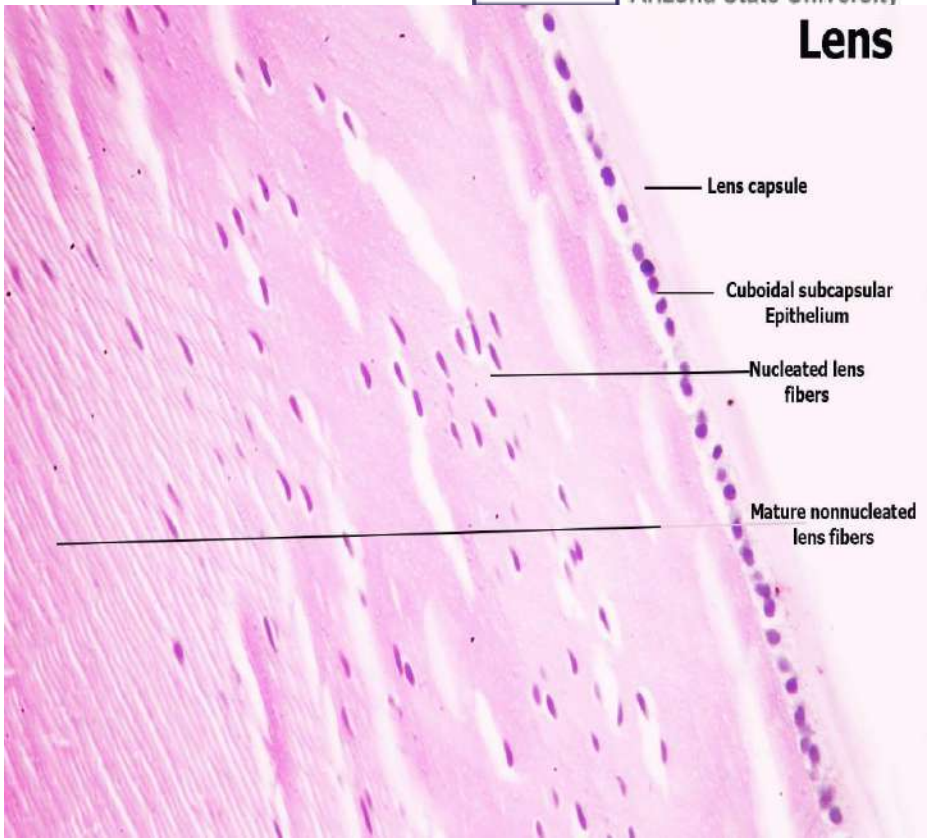

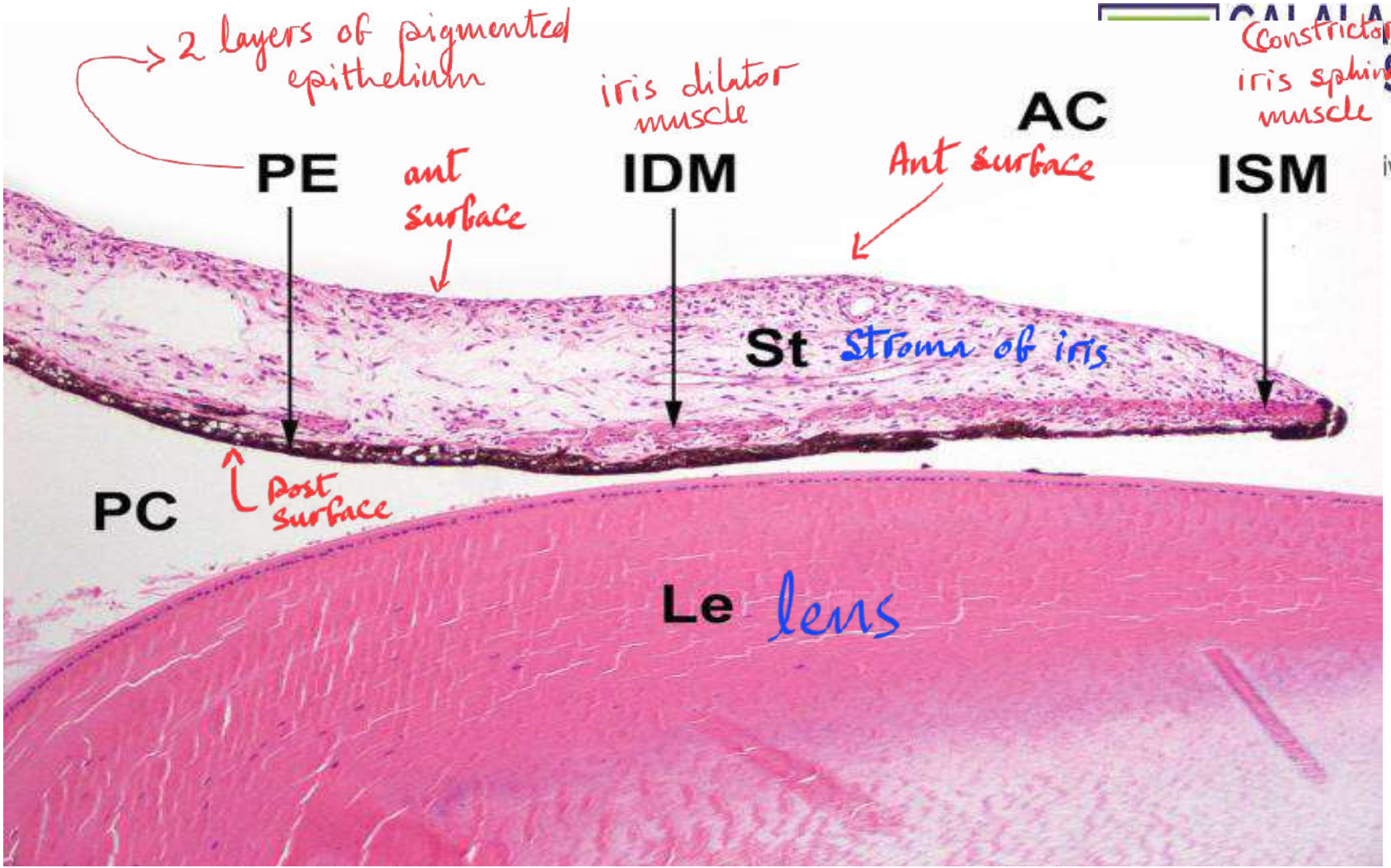
2 layers of pigmented epithelium
PE
ant surface
iris dilator muscle
IDM
AC
Ant surface
(Constrictor) iris sphincter muscle
ISM
St
Stroma of iris
PC
Post surface
Le
lens

Choroid, chorio-capillaries, RPE and photoreceptors

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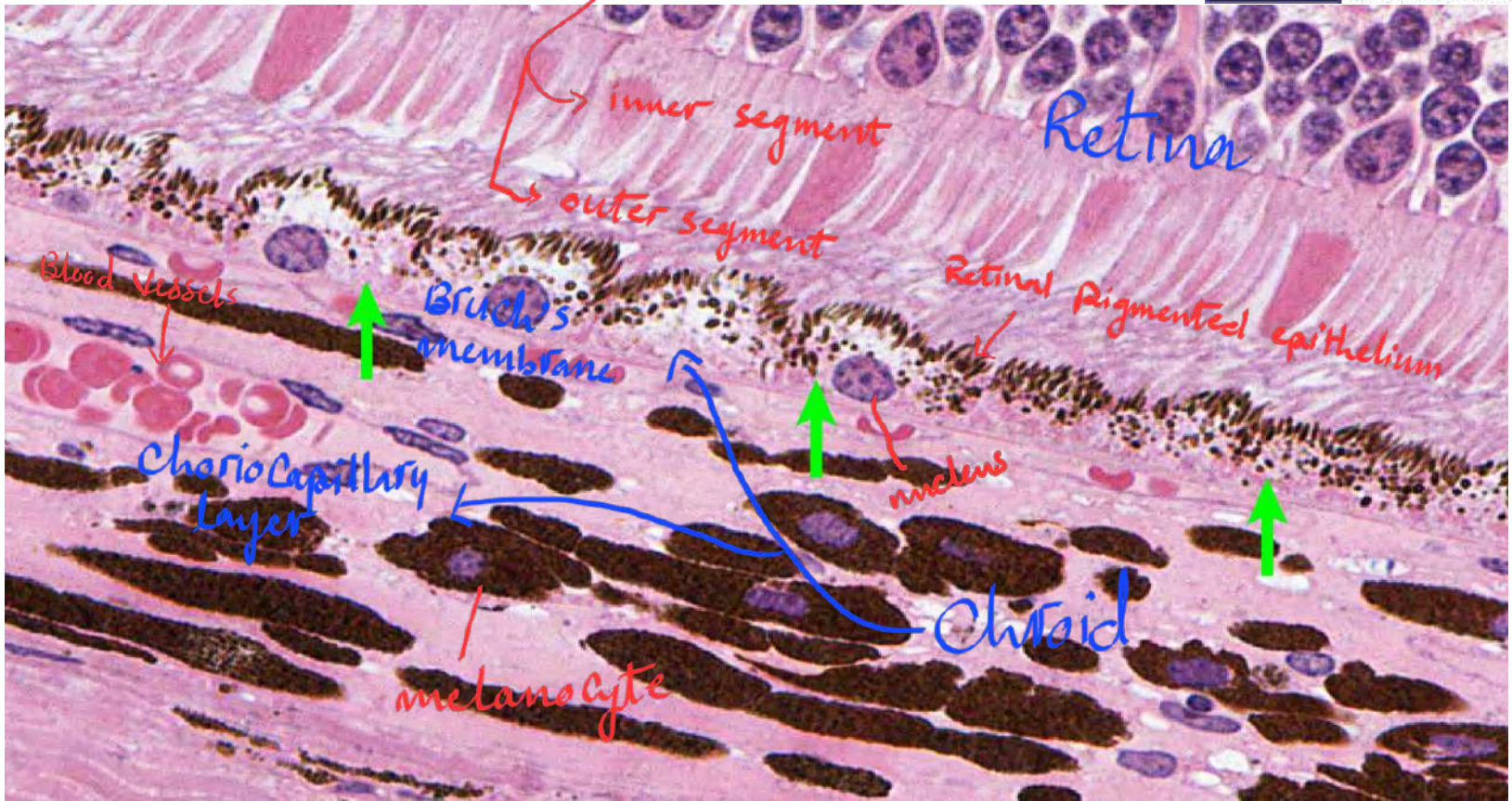

Drainage of Aqueous Humor

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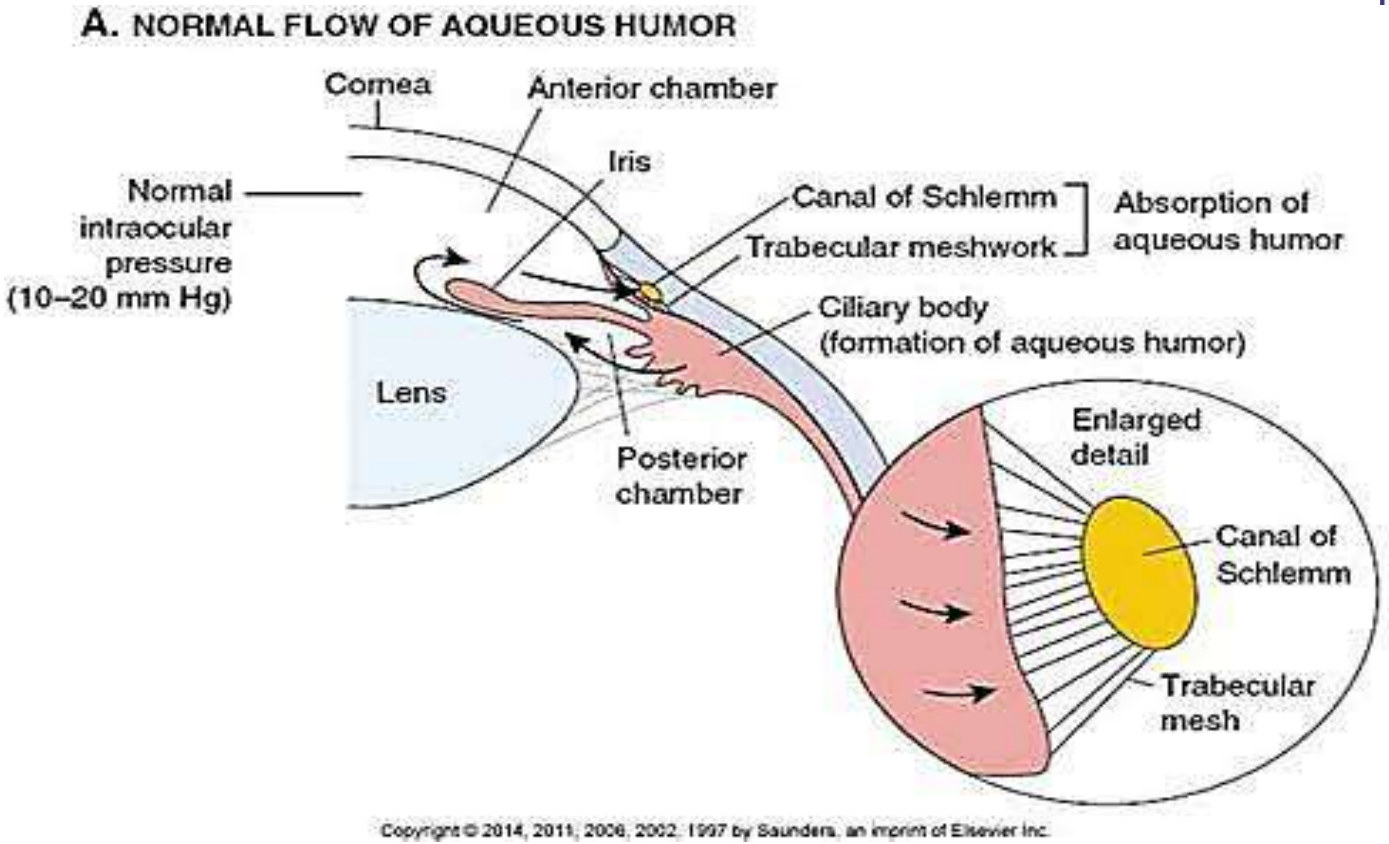

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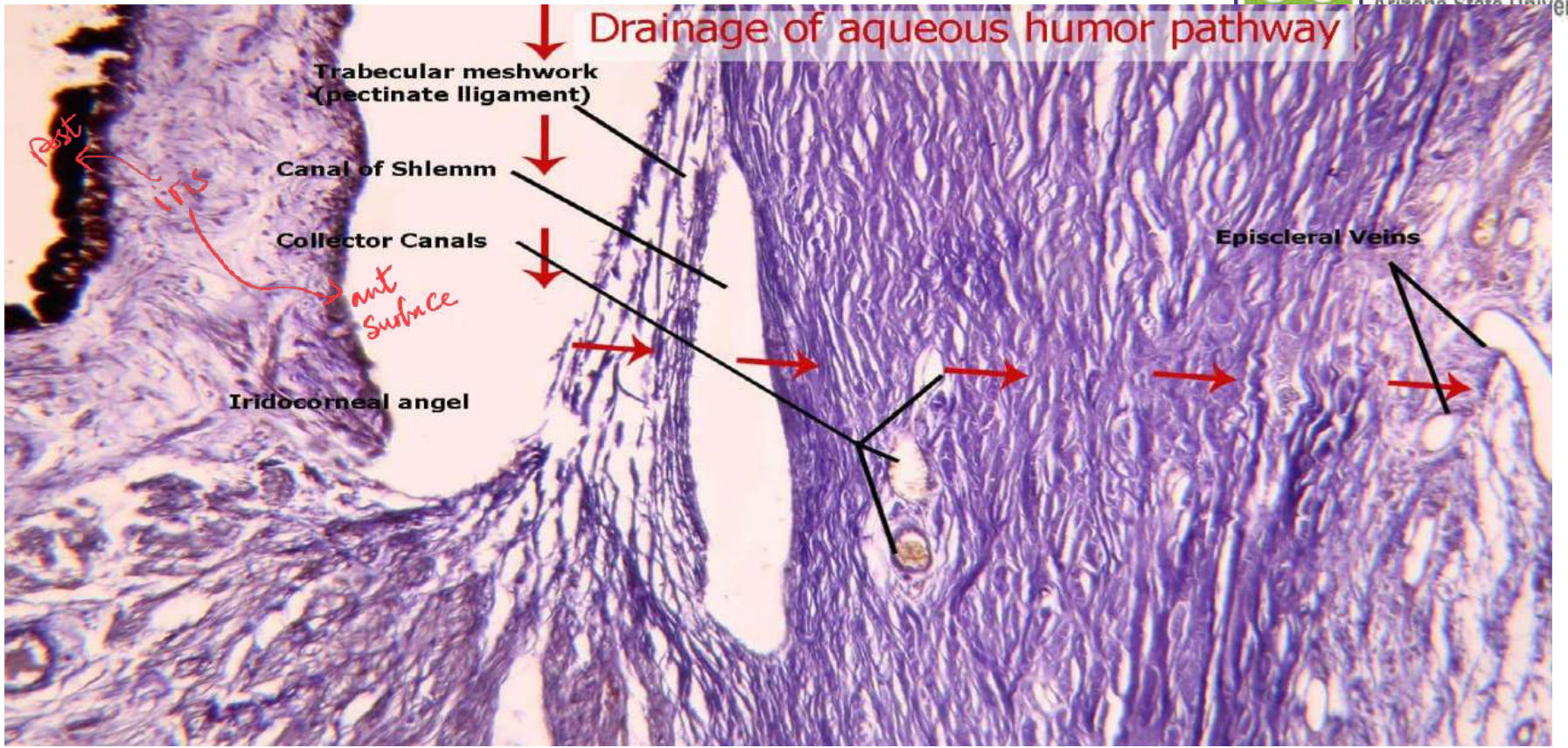
Drainage of Aqueous Humor



The retinal layers

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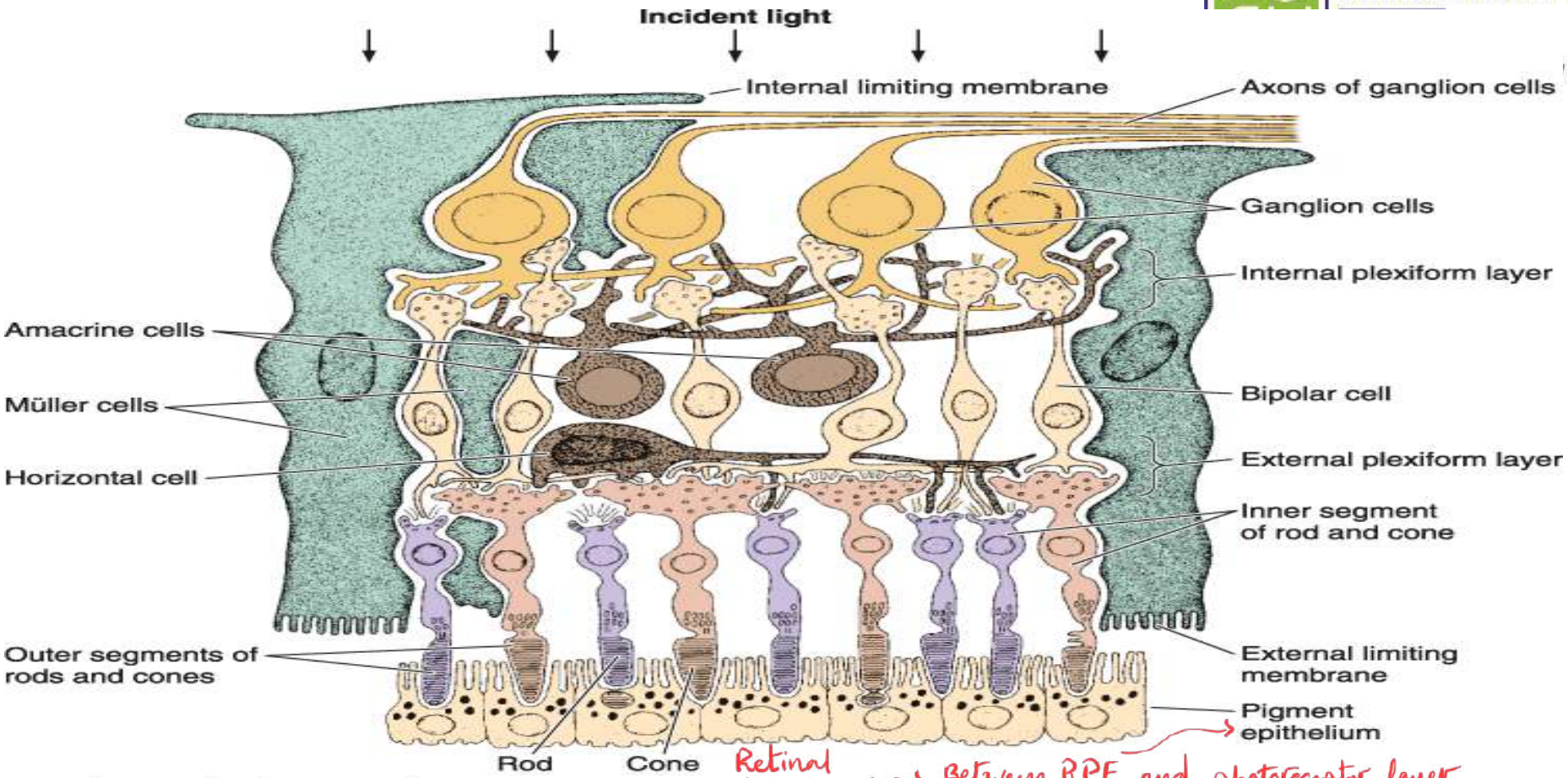

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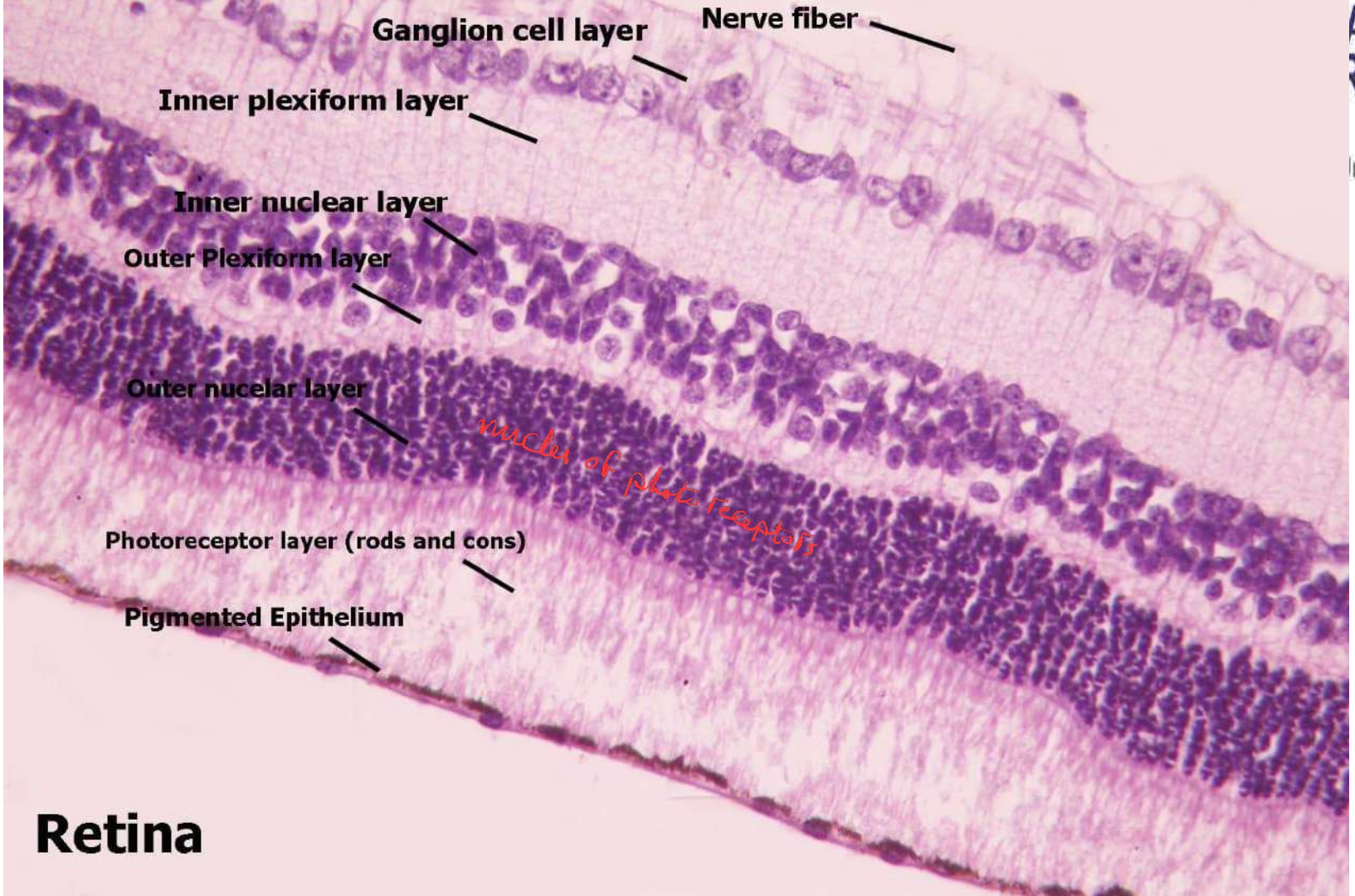
Ganglion cell layer
Nerve fiber
Inner plexiform layer
Inner nuclear layer
Outer Plexiform layer
Outer nucelar layer
nuclei of photoreceptors
Photoreceptor layer (rods and cons)
Pigmented Epithelium
Retina

The retinal layers

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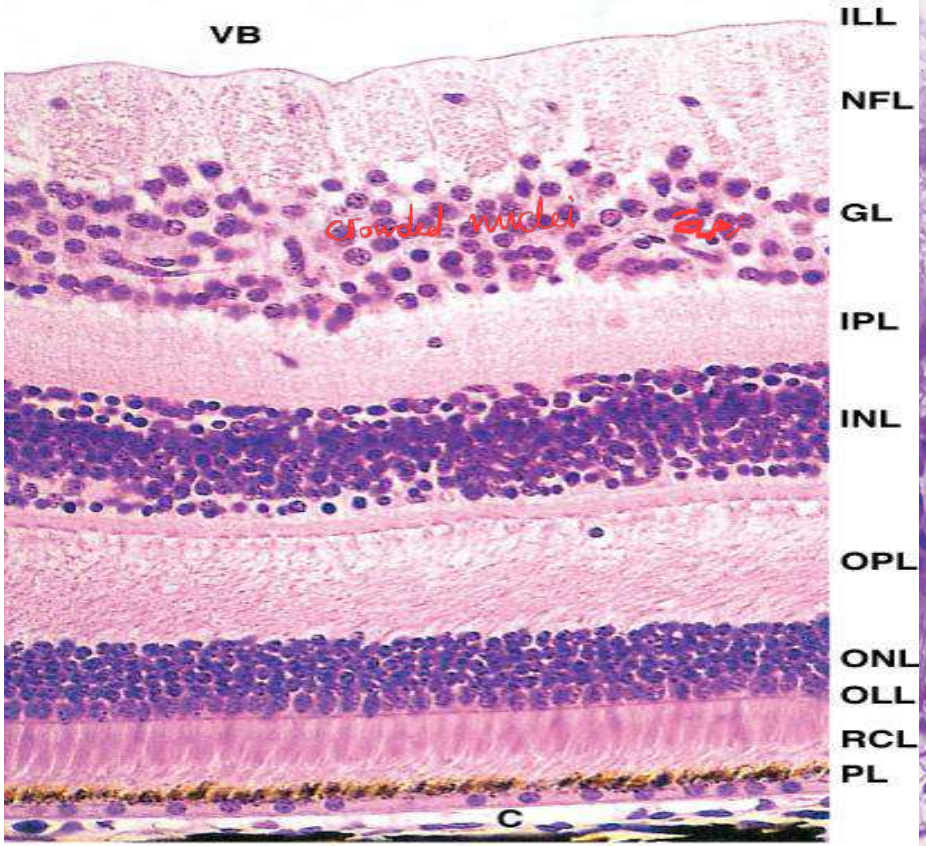

Source: Mescher AL: *Junqueira's Basic Histology: Text and Atlas, 12th Edition:* http://www.accessmedicine.com
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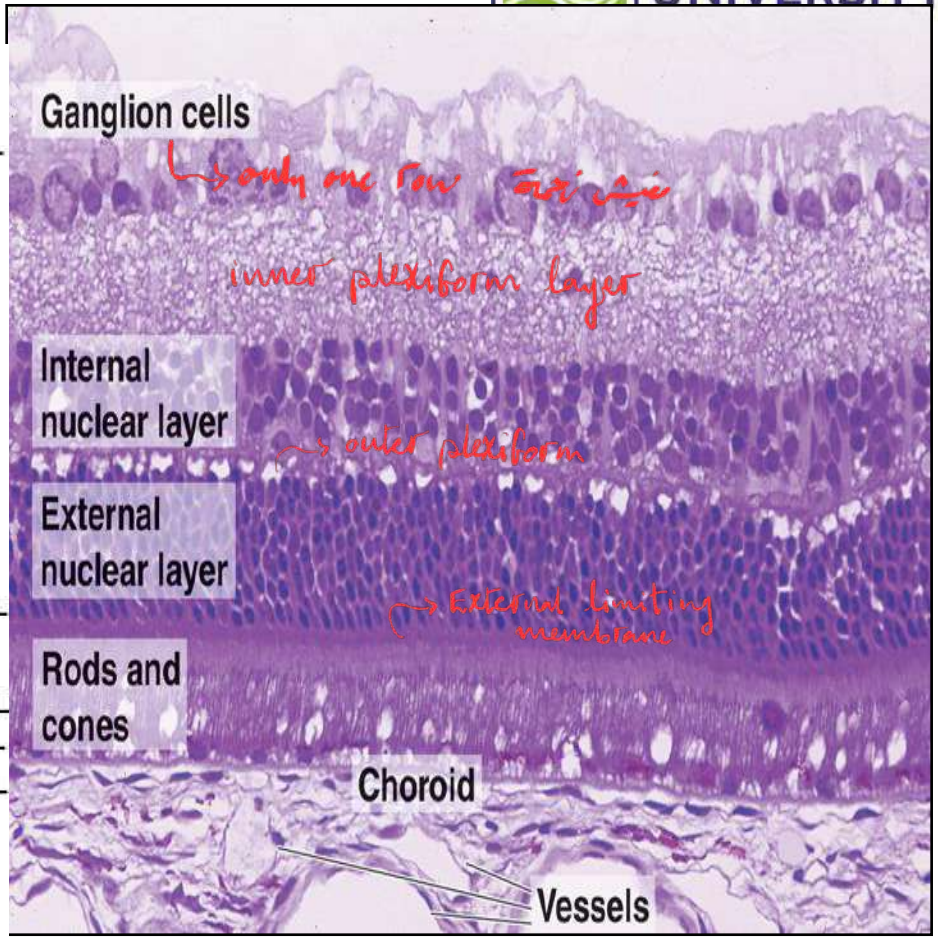
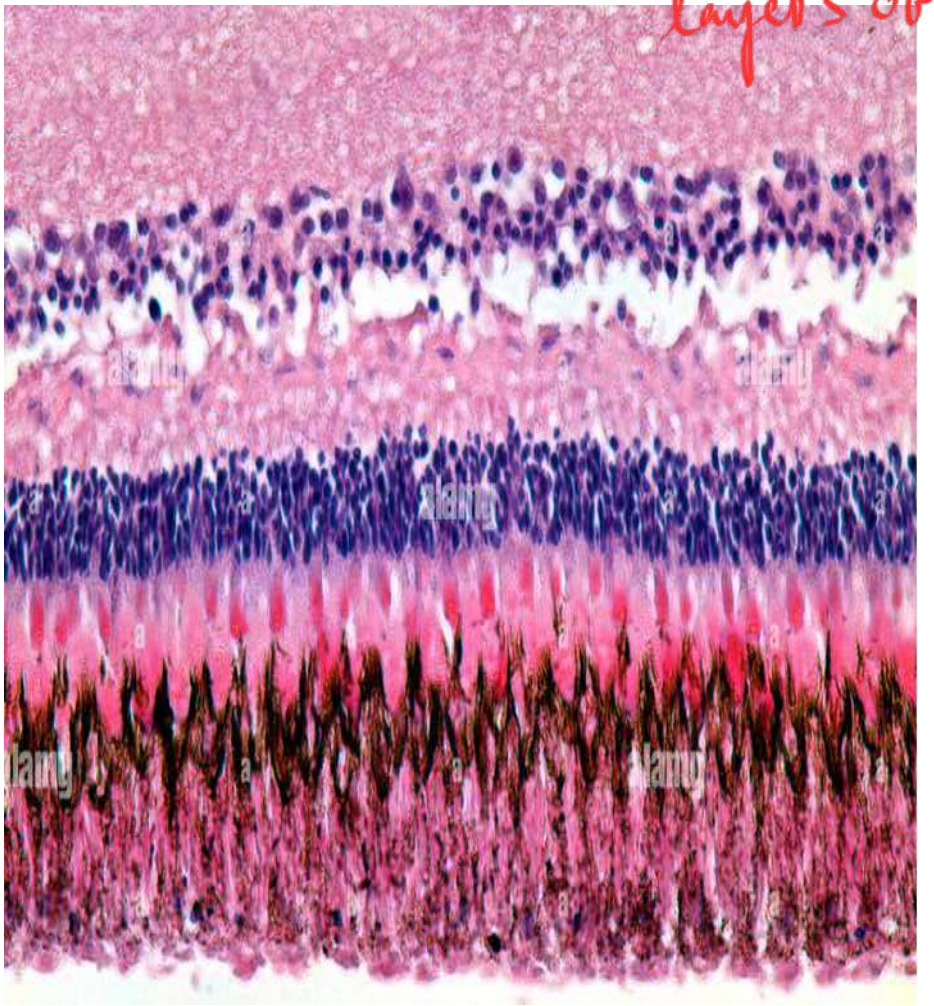
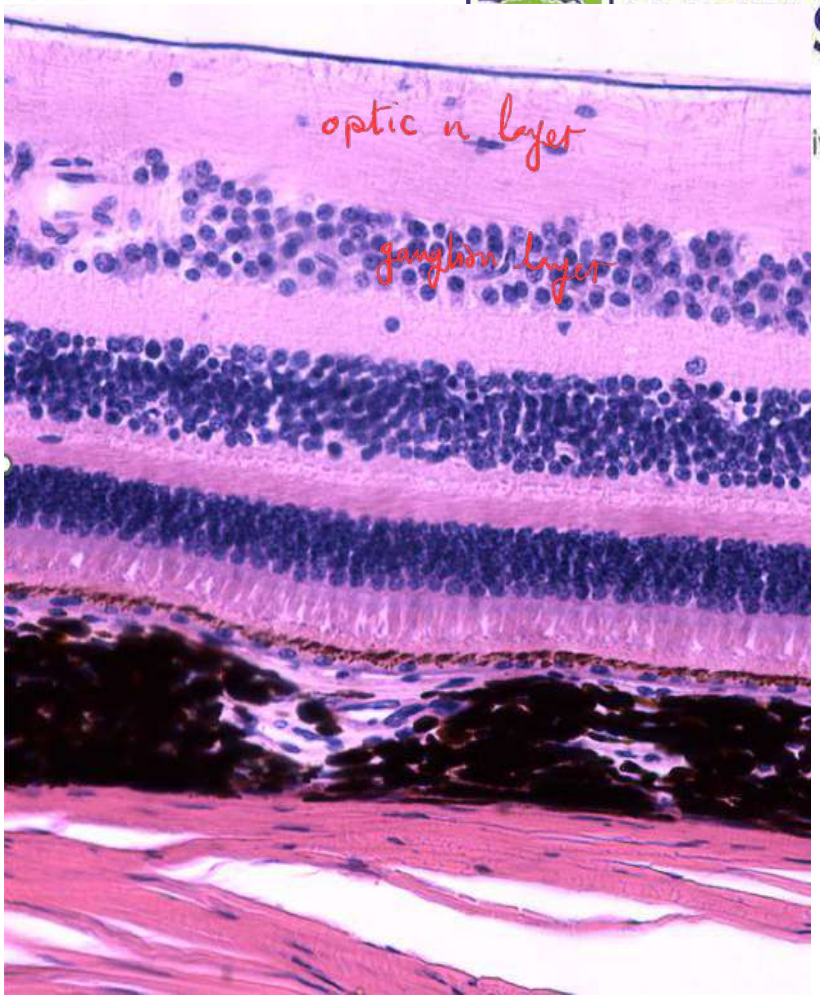


Layers of Retina





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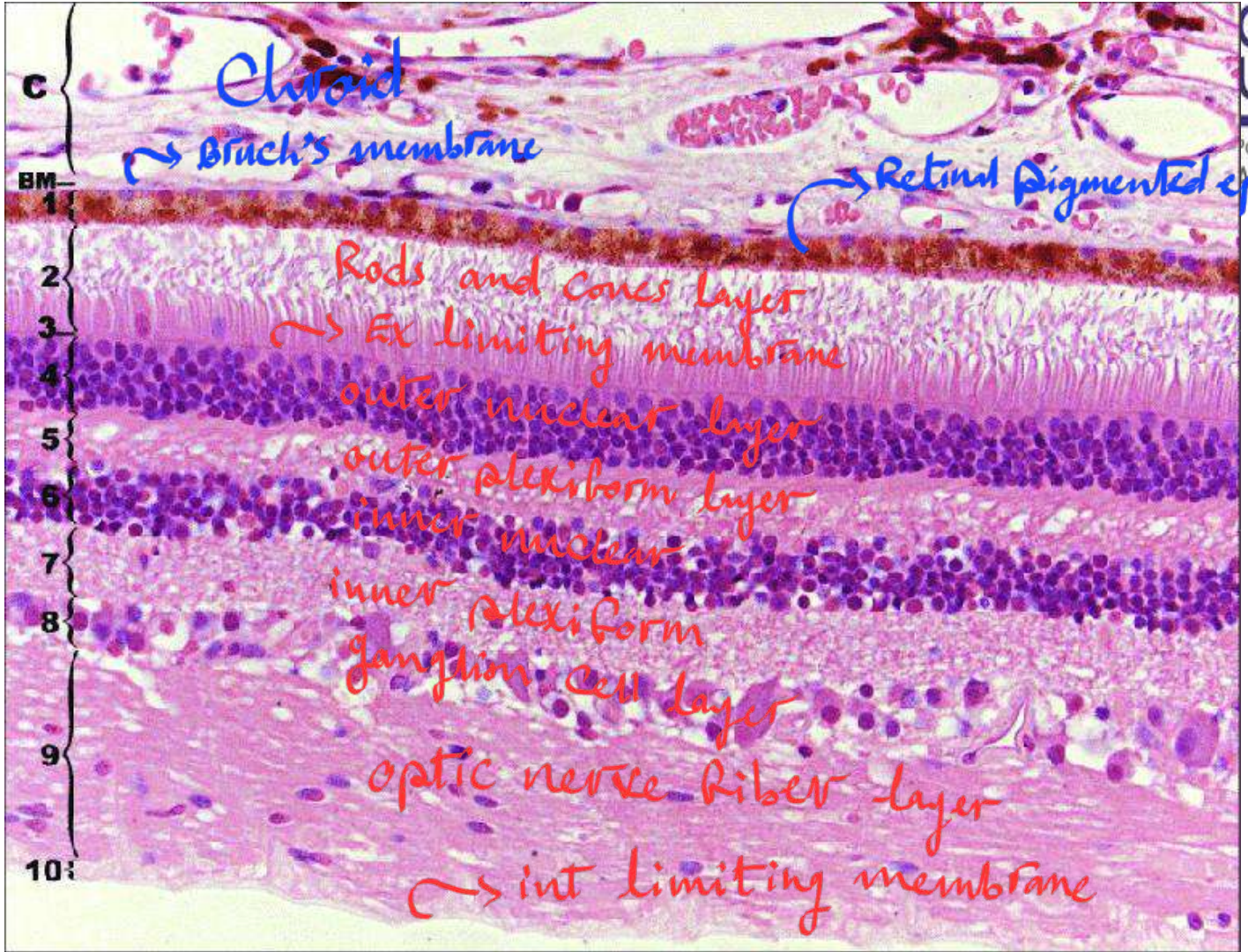

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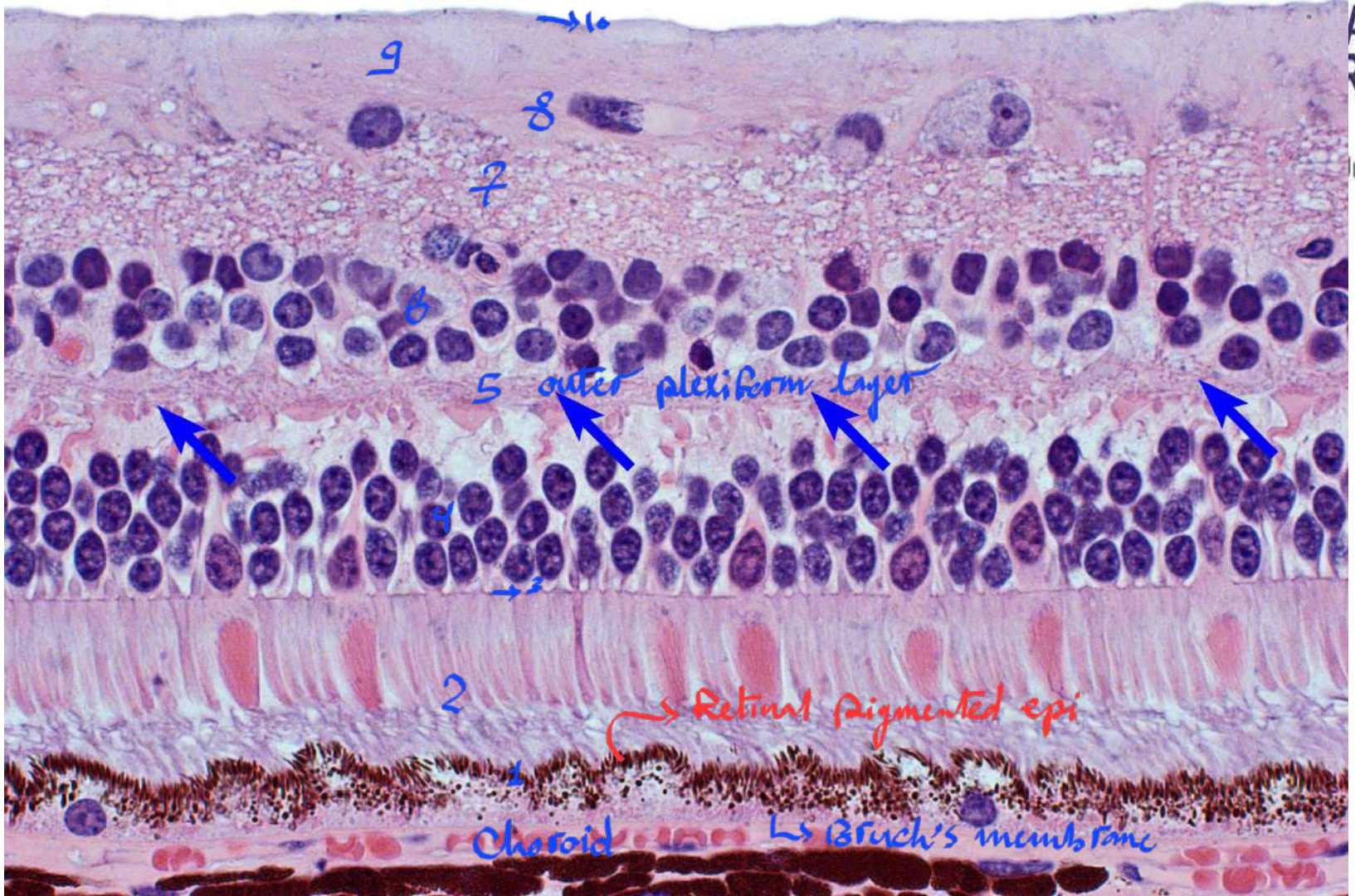
9
8
7
6
5 outer plexiform layer
4
2
Retinal pigmented epi
Choroid
Bruch's membrane

The rod and cone cells

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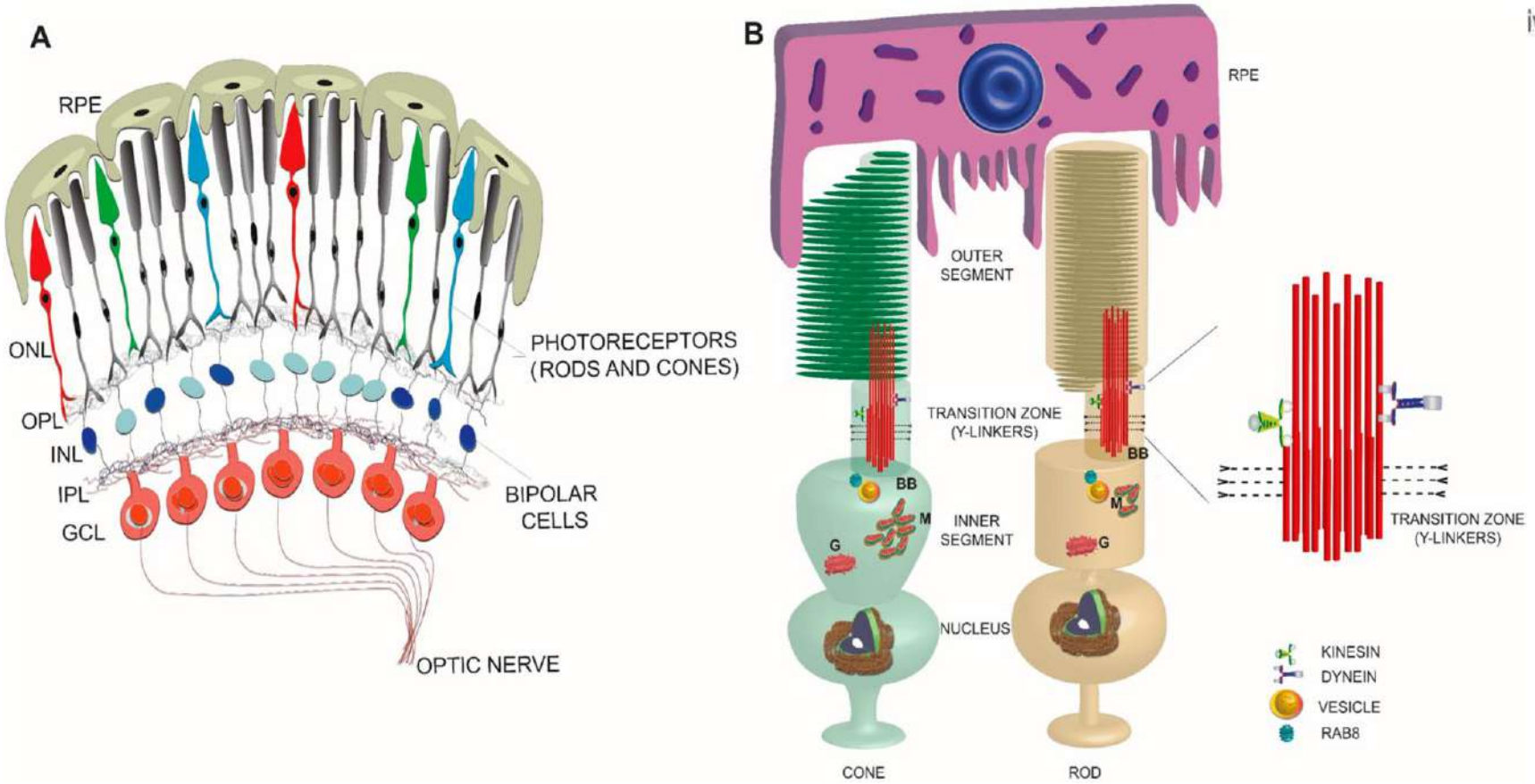
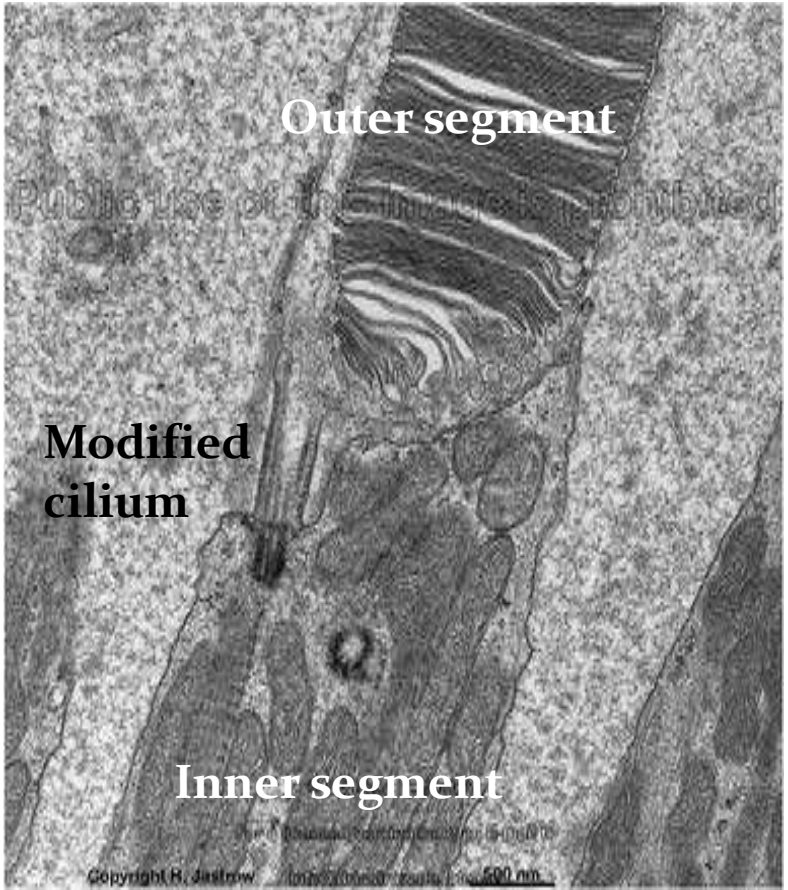
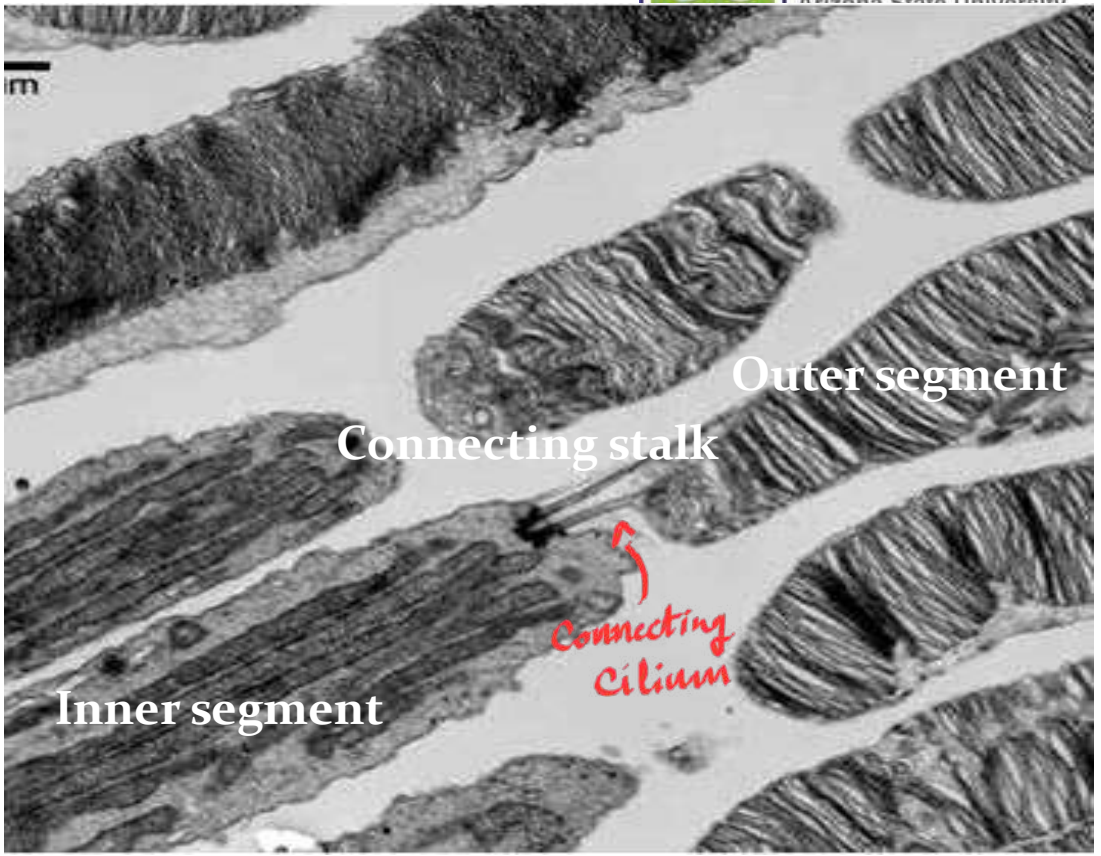


EM picture of the photoreceptors.





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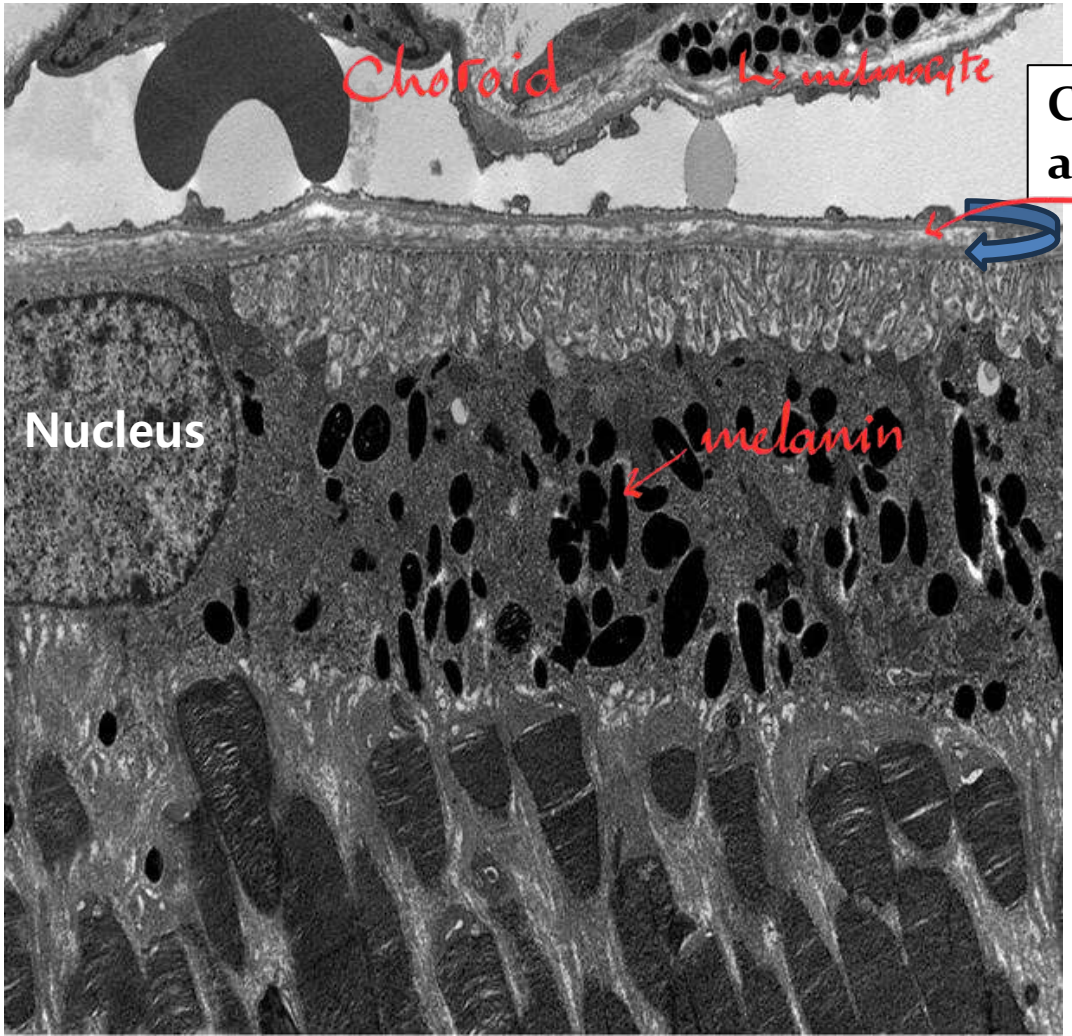

Chorio-capillaries and bruch's membrane

Basal membrane infoldings

RPE with melanin granules

Ion transporting
- RPE
- Corneal endothelium

Outer segment of photoreceptors and microvilli of PRE

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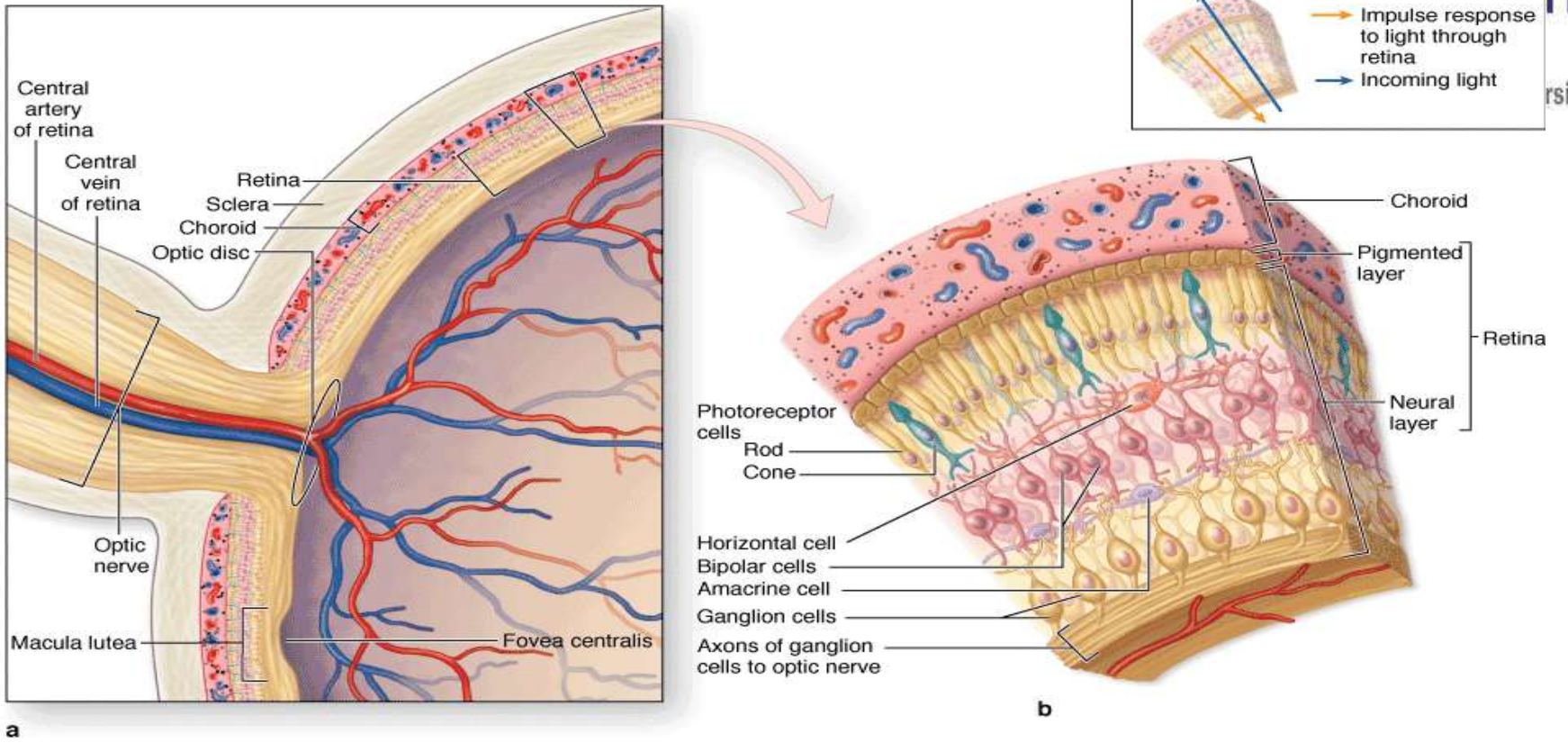

Source: Mescher AL: *Junqueira's Basic Histology: Text and Atlas, 12th Edition:* http://www.accessmedicine.com

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Optic disc and macule lutea

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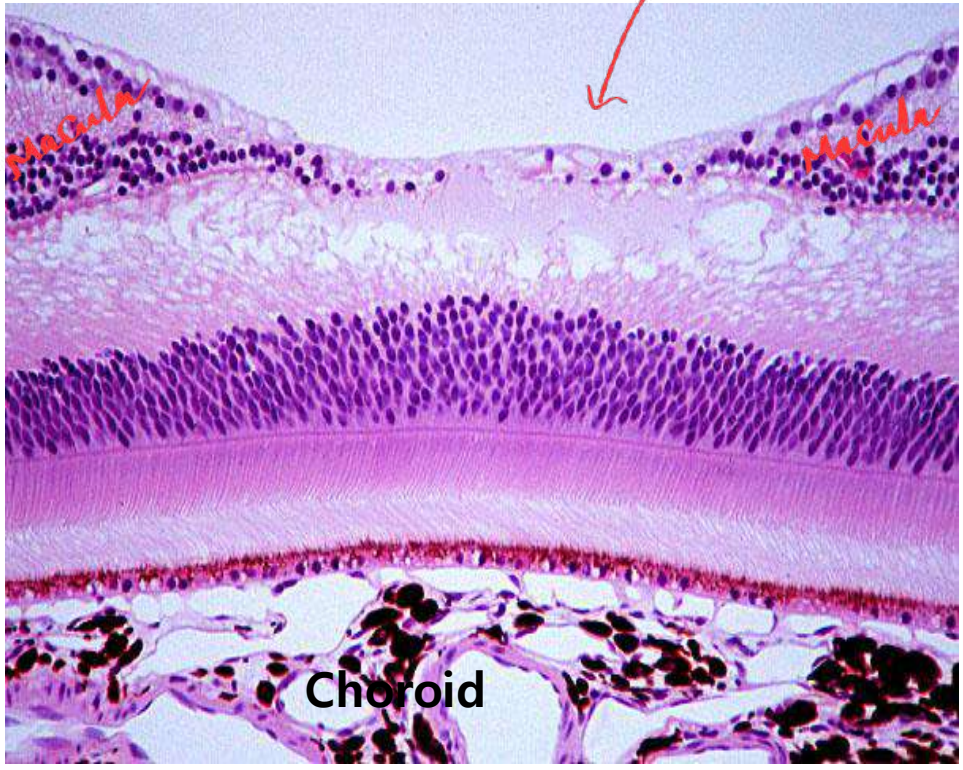
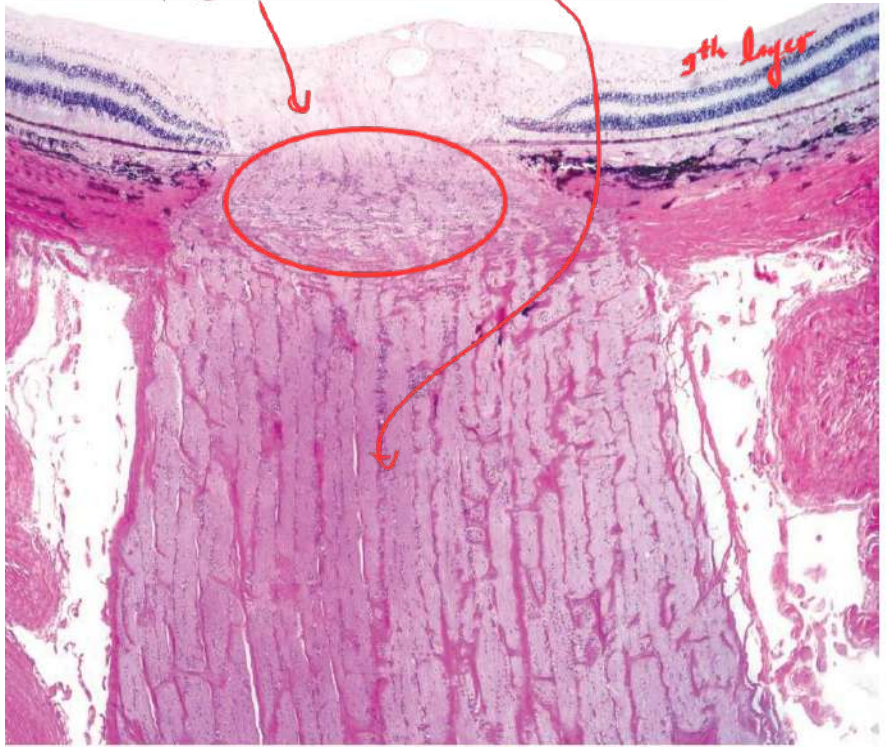
Macula lutea and fovea centralis

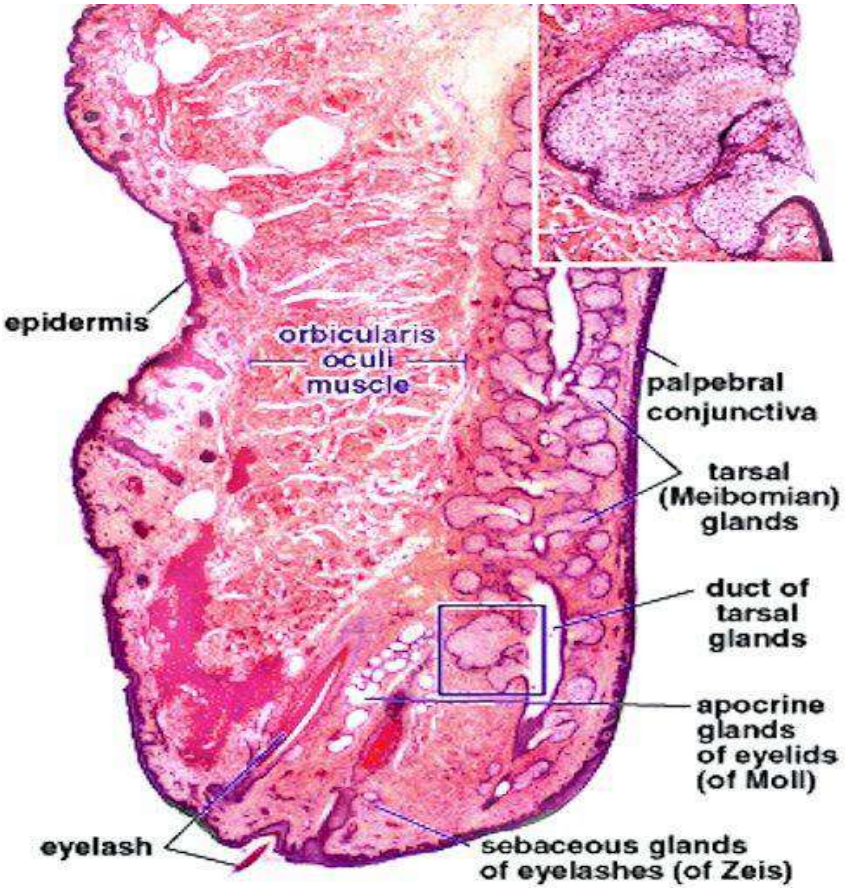


Optic disc and nerve



not important for Exam

Eye lid



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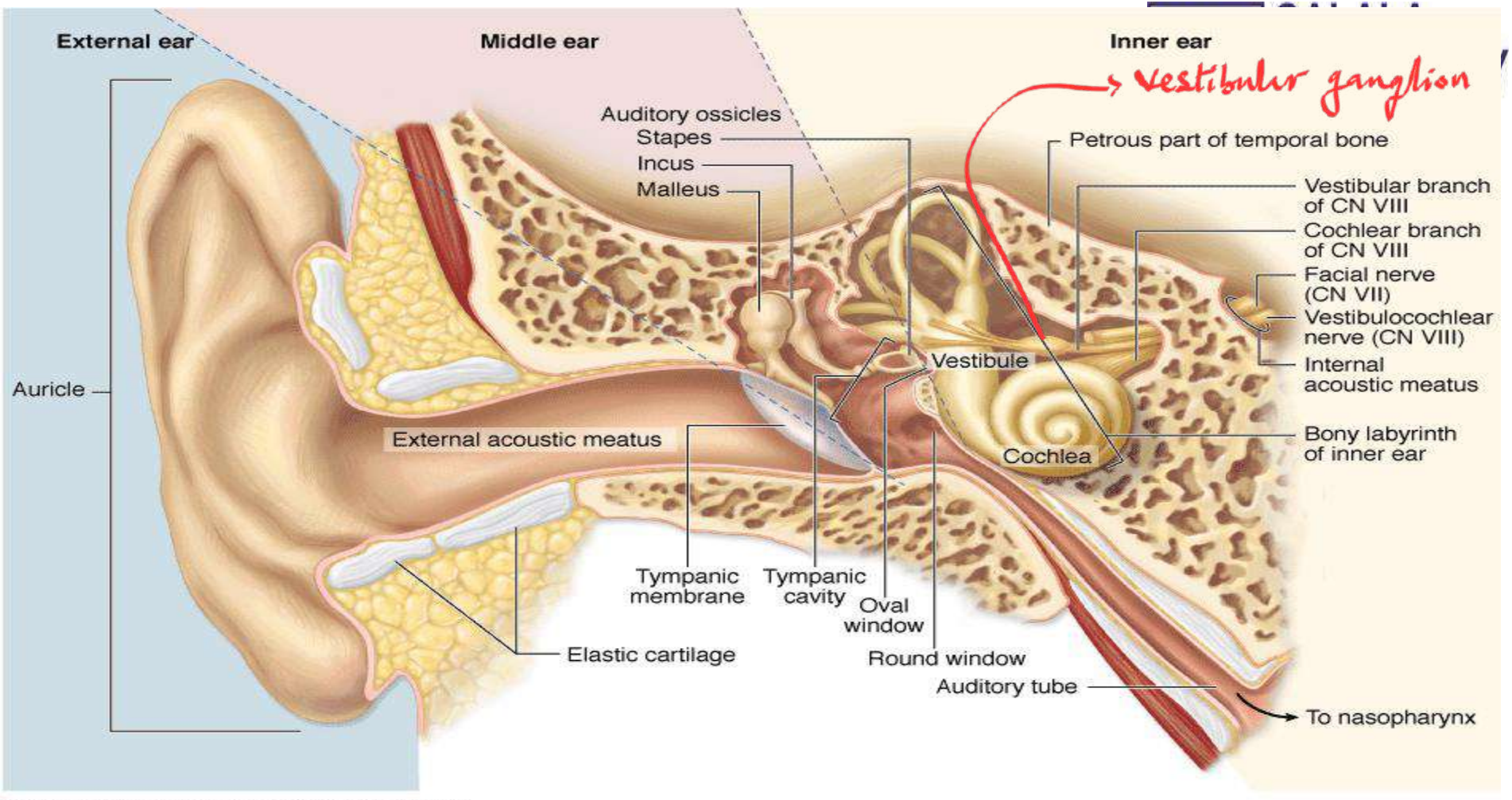
Intended Learning Outcomes

By the end of this lecture, you should be able to:

1. **Describe the structure of the cochlear duct and organ of corti.**
2. **Describe the structure of Maculae and Cristea ampularis.**
3. **Identify SEM picture of the hair cells of organ of corti.**



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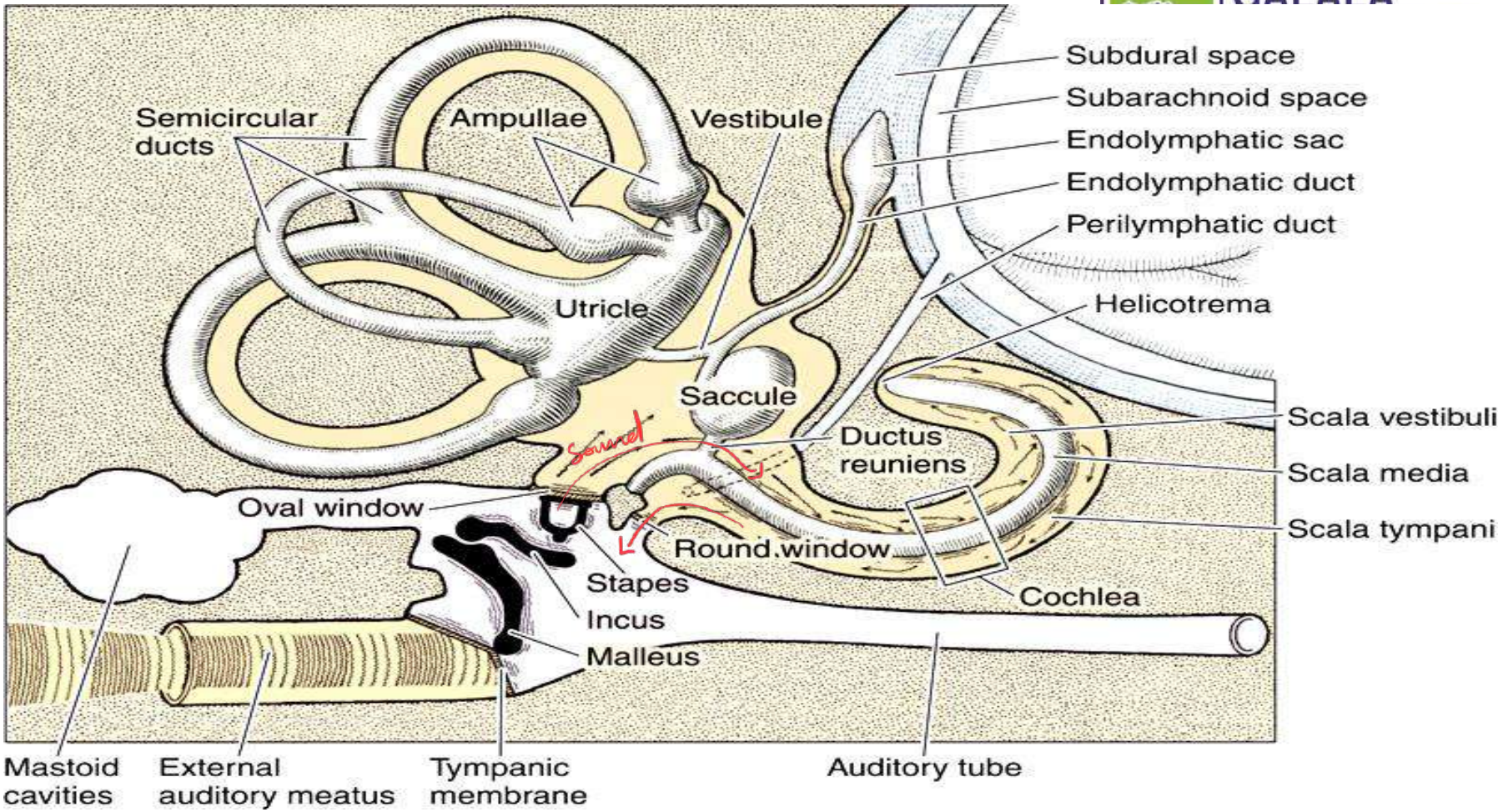
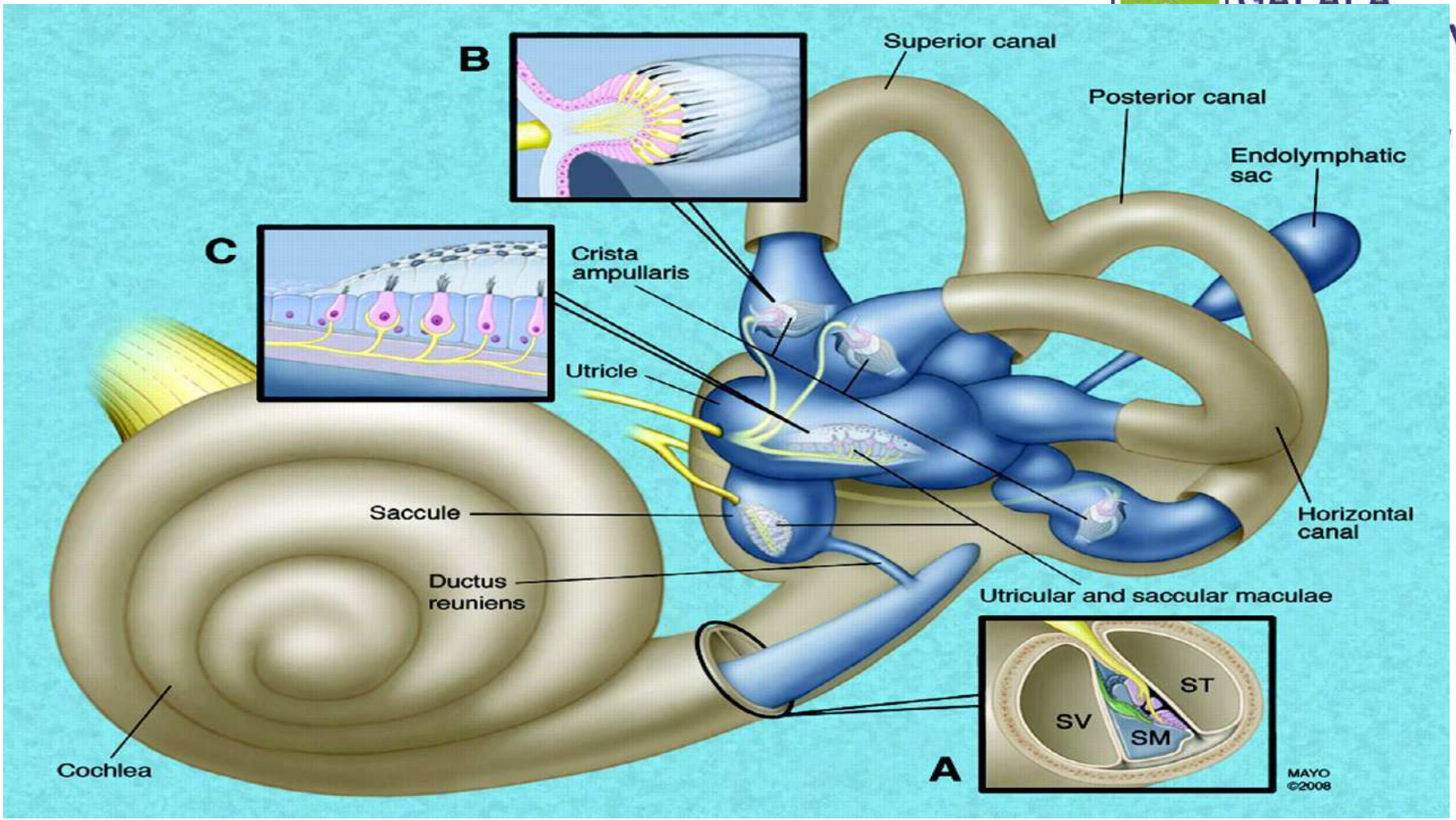

Subdural space
Subarachnoid space
Endolymphatic sac
Endolymphatic duct
Perilymphatic duct
Helicotrema
Semicircular ducts
Ampullae
Vestibule
Utricle
Saccule
Scala vestibuli
Ductus reuniens
Scala media
Scala tympani
Oval window
Round window
Cochlea
Stapes
Incus
Malleus
Mastoid cavities
External auditory meatus
Tympanic membrane
Auditory tube


B
C
Superior canal
Posterior canal
Endolymphatic sac
Crista ampullaris
Utricle
Saccule
Ductus reuniens
Utricular and saccular maculae
Horizontal canal
Cochlea
A
ST
SV
SM
MAYO ©2008

Cochlea and Cochlear duct

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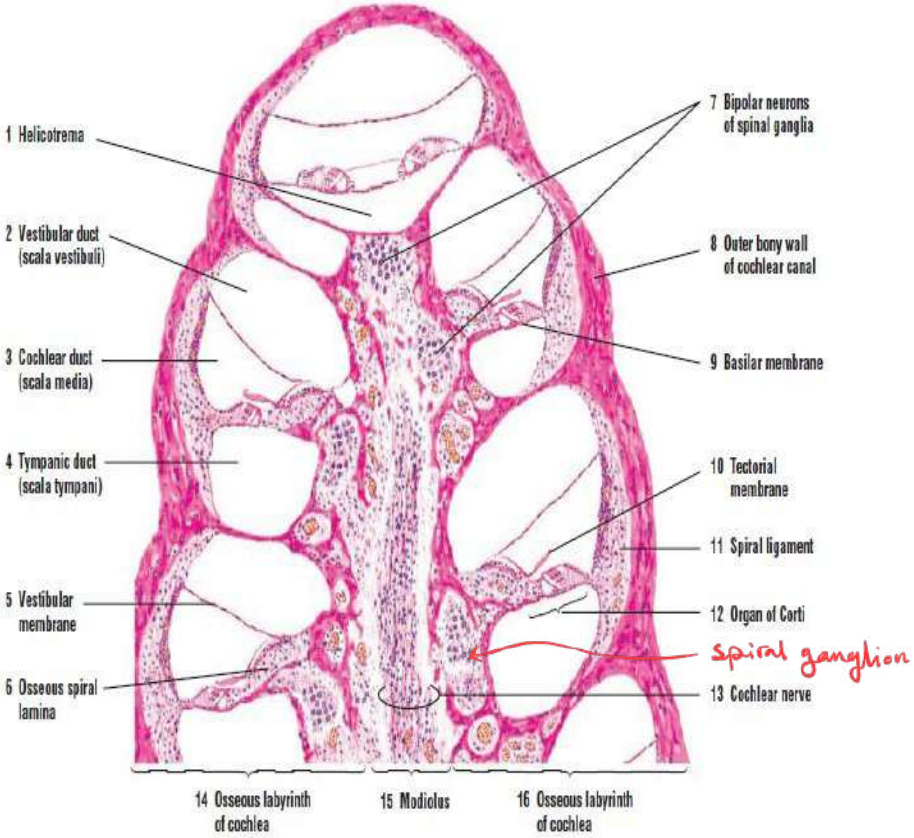

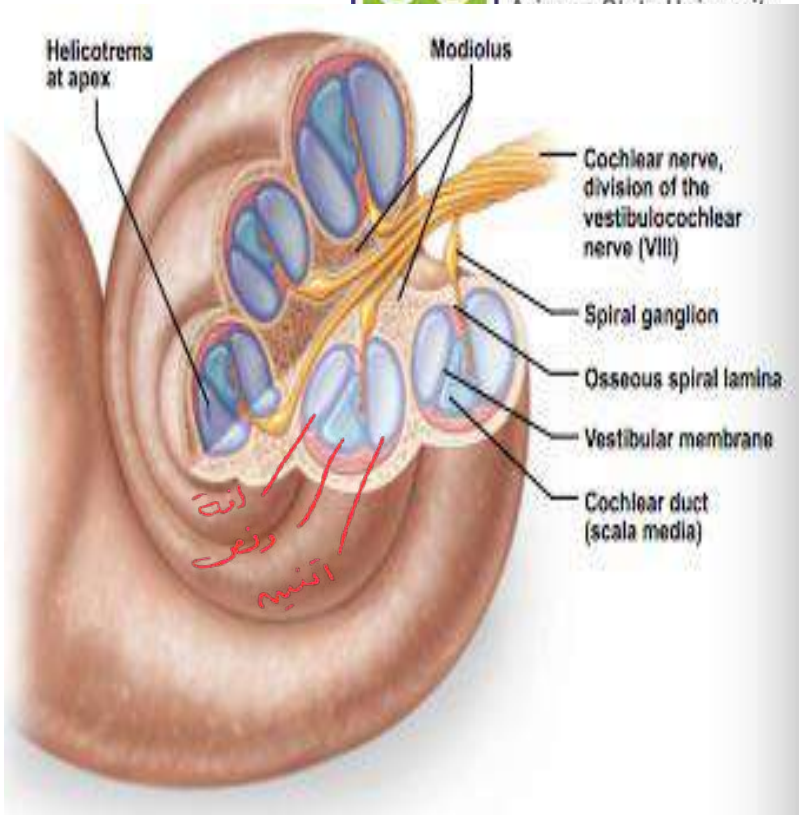

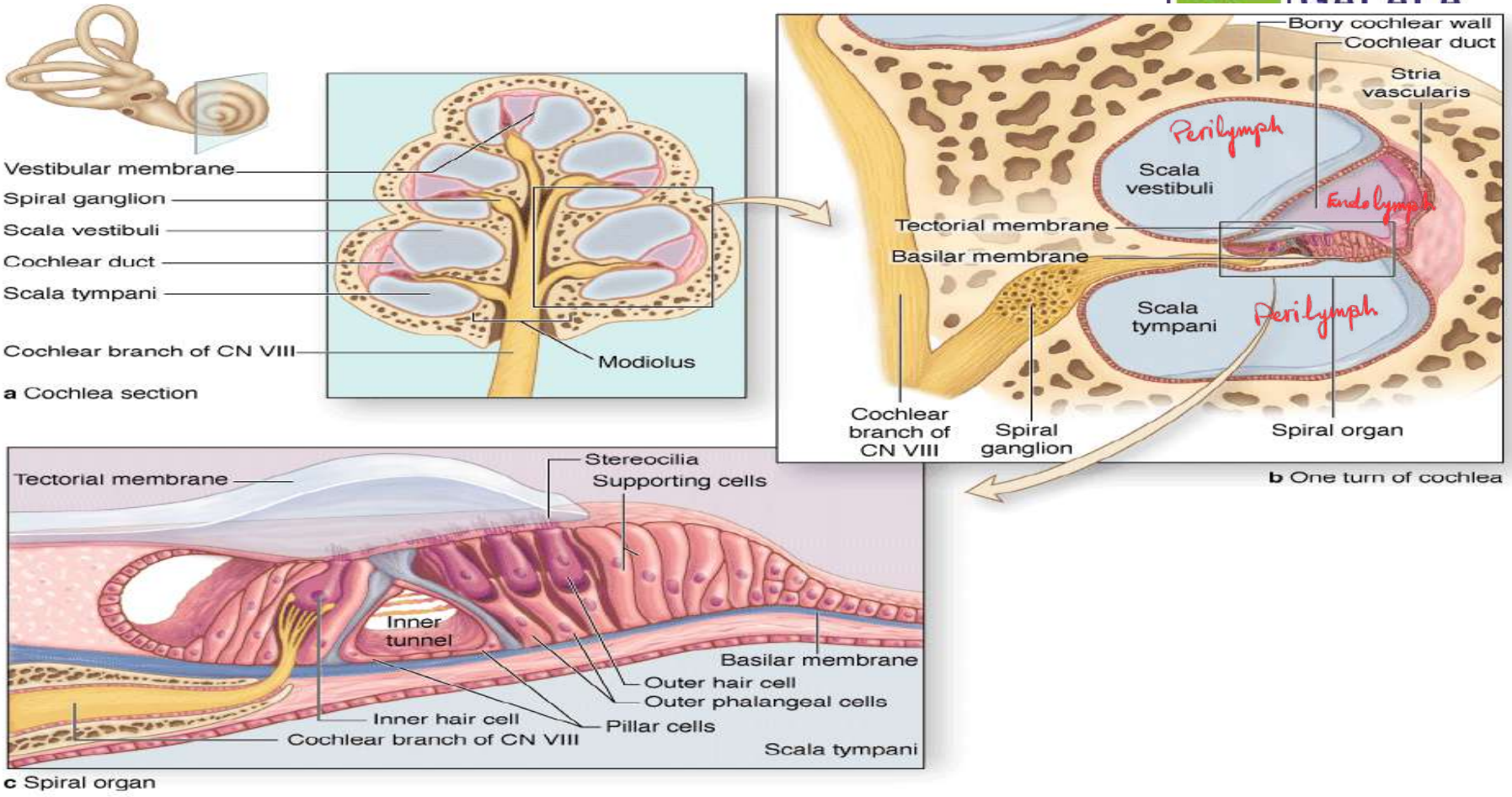

Source: Mescher AL: *Junqueira's Basic Histology: Text and Atlas, 12th Edition*: http://www.accessmedicine.com
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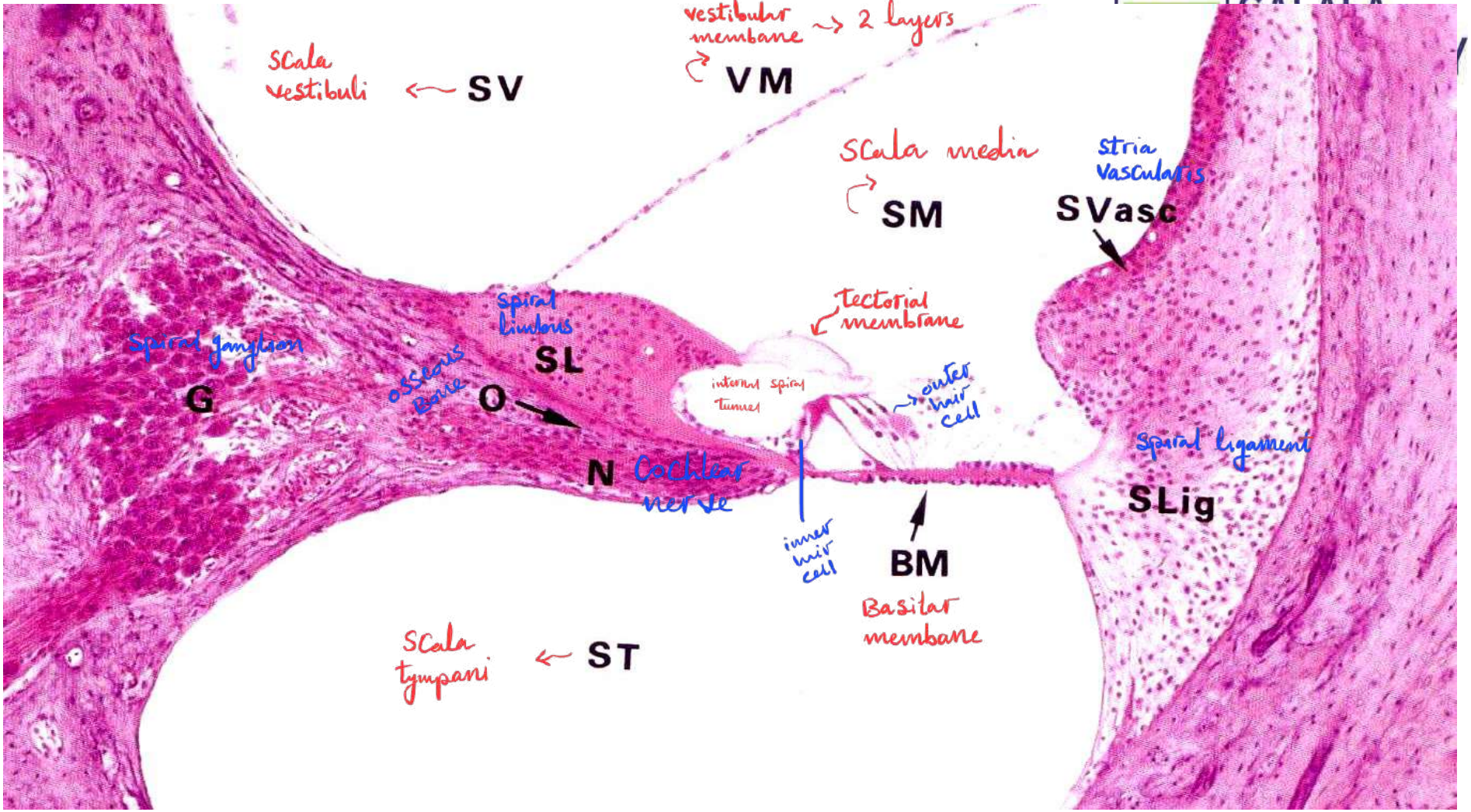
vestibular membrane → 2 layers
Scala vestibuli ← SV
VM
Scala media
SM
Stria Vascularis
SVasc
Spiral ligament
Spiral ganglion
G
Spiral limbus
SL
osseous Bone
O
Tectorial membrane
internal spiral Tunnel
outer hair cell
N Cochlear nerve
inner hair cell
BM
Basilar membrane
SLig
Scala tympani ← ST

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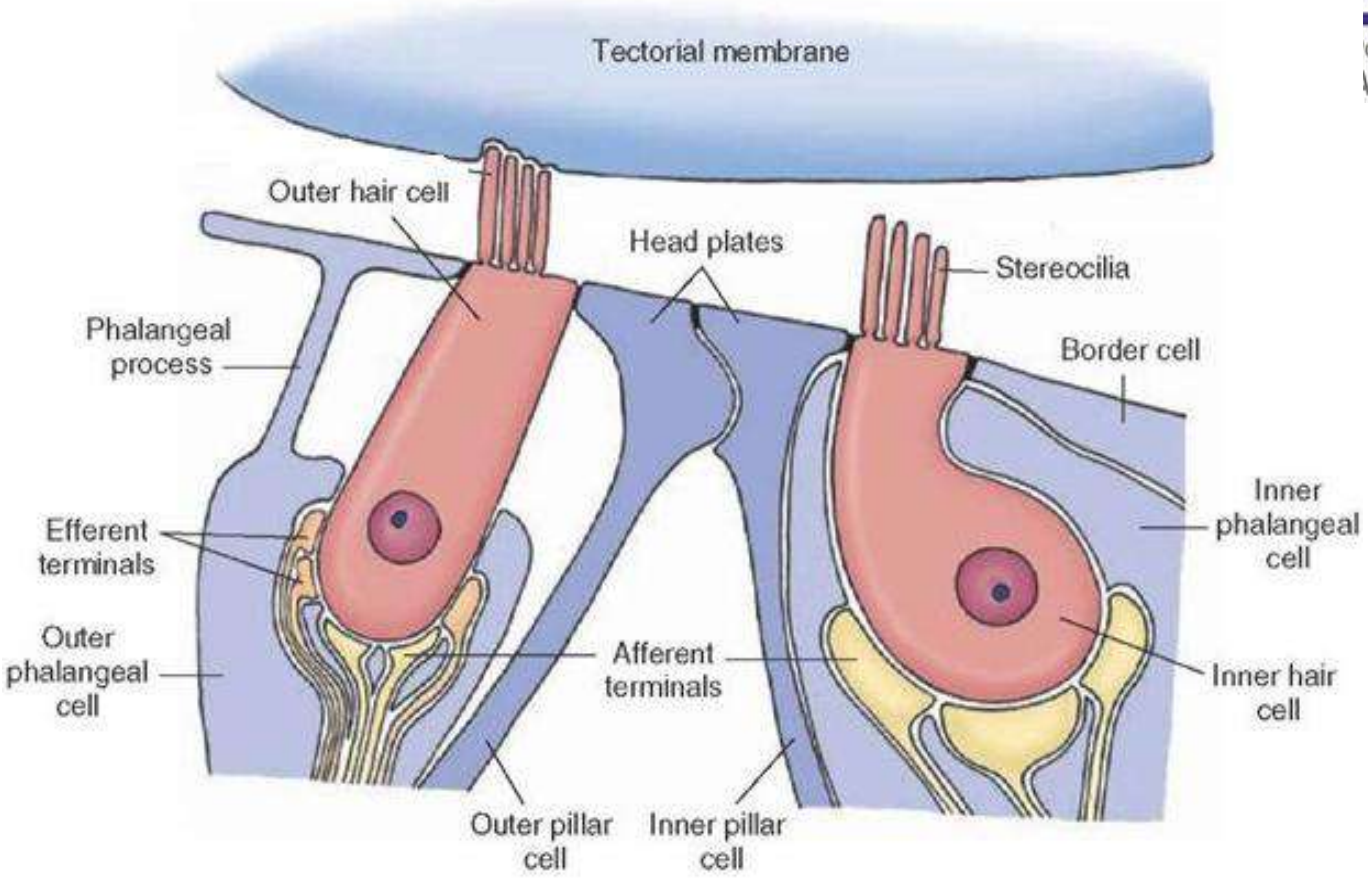
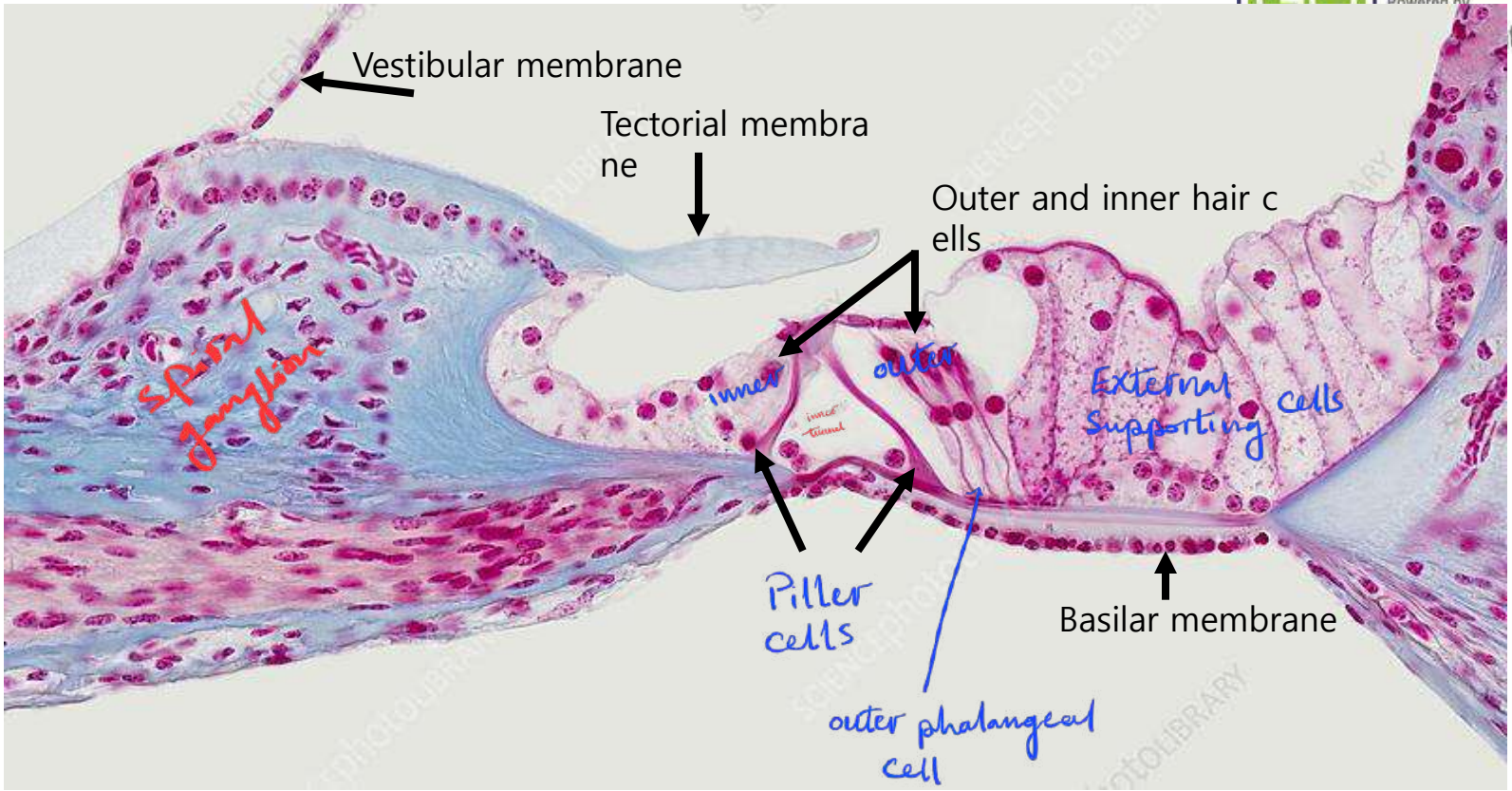
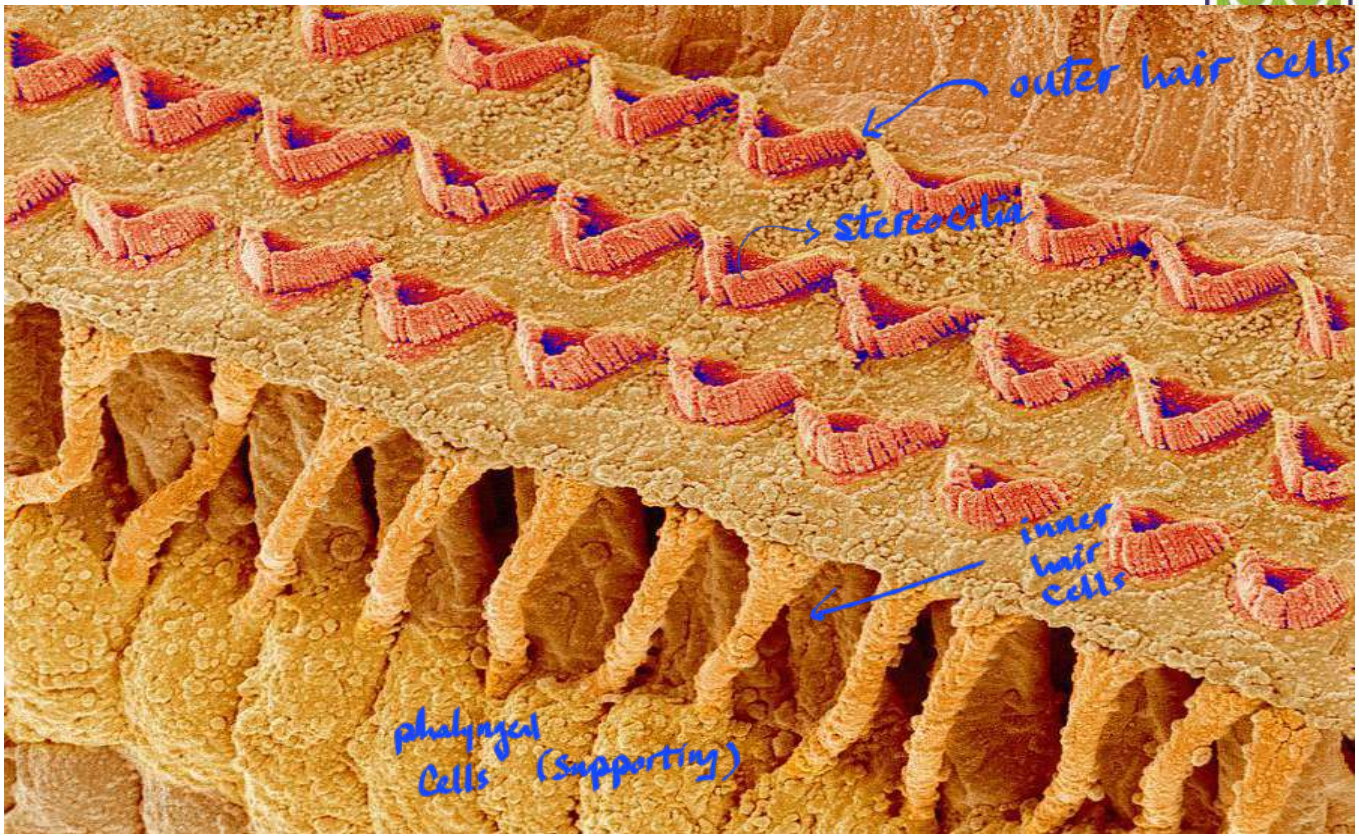


Organ of Corti



Hair Cells by SEM



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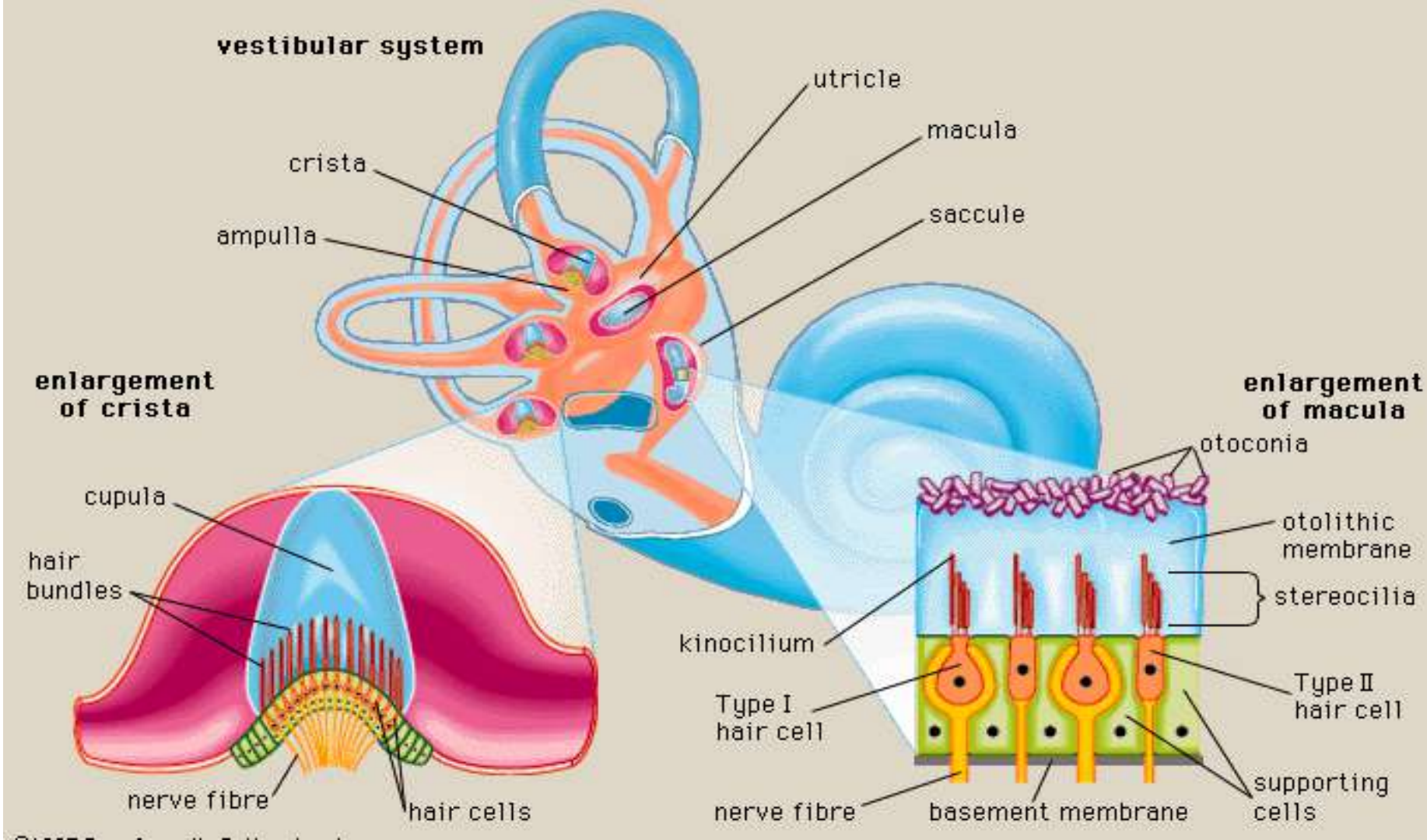
vestibular system
utricle
macula
crista
saccule
ampulla
enlargement of crista
enlargement of macula
cupula
hair bundles
otoconia
otolithic membrane
stereocilia
kinocilium
Type I hair cell
Type II hair cell
nerve fibre
hair cells
nerve fibre
basement membrane
supporting cells

Macula

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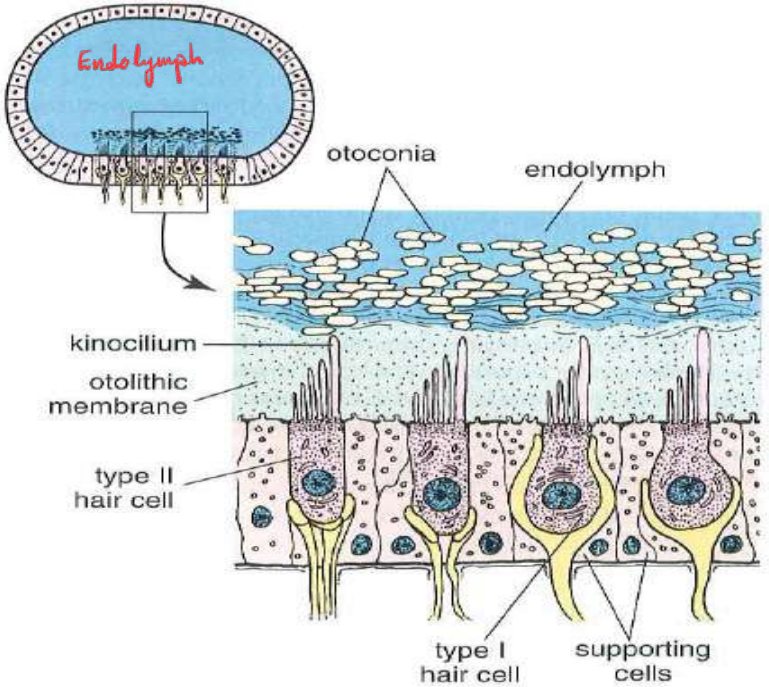
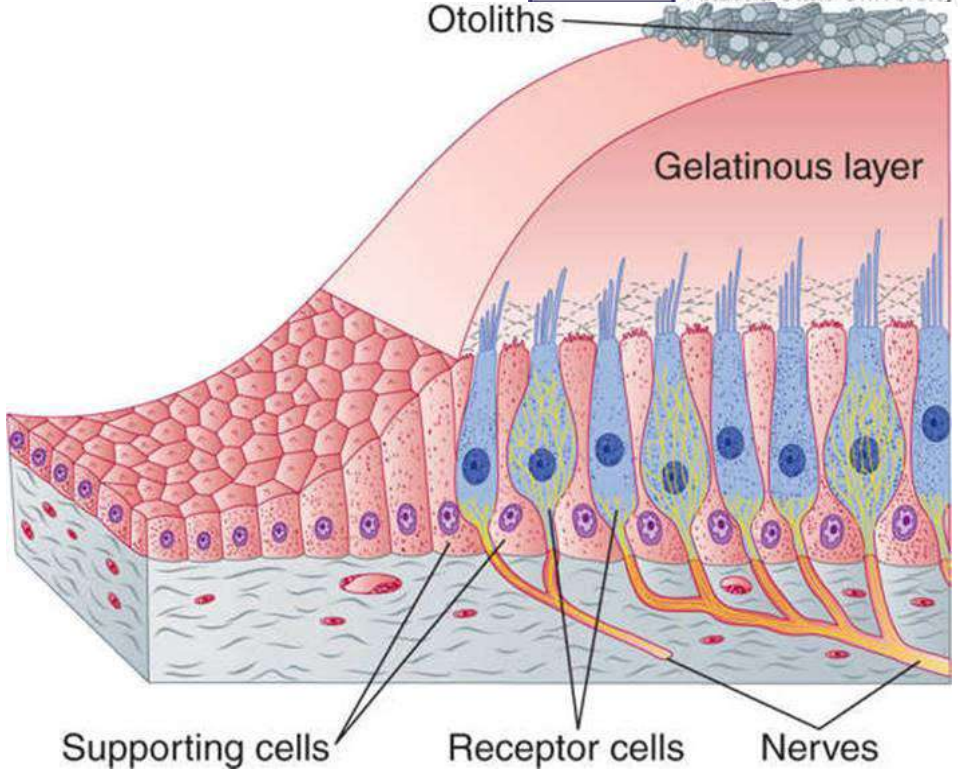
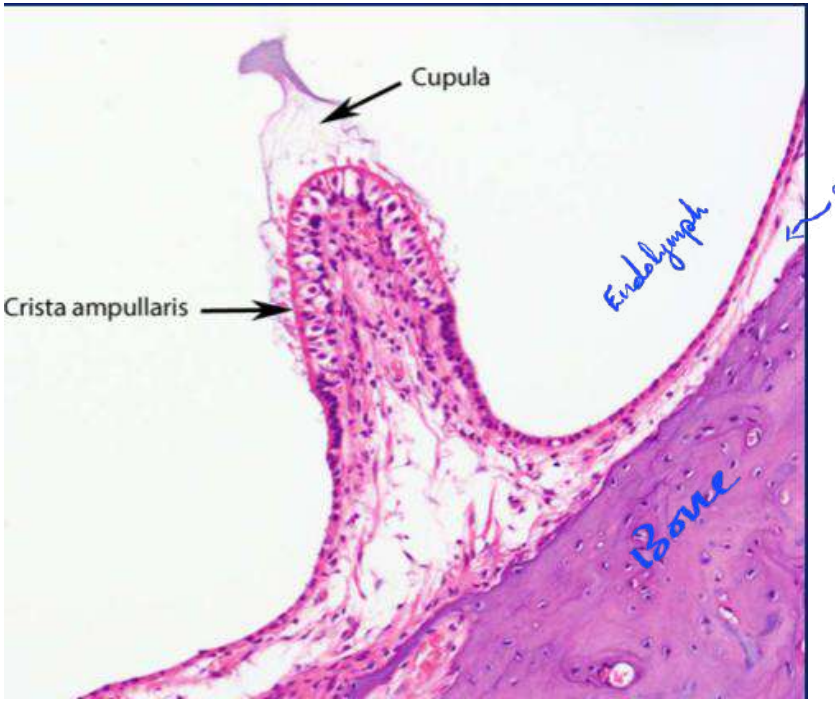
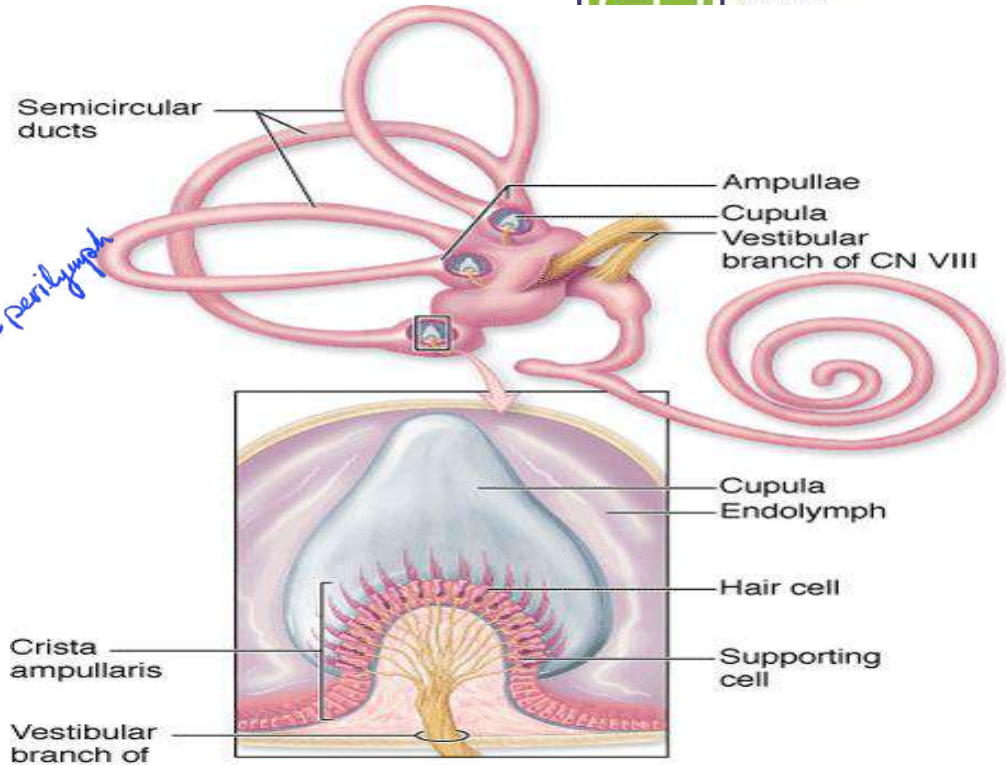




Crista Ampularis





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Macula &Cristea Ampularis

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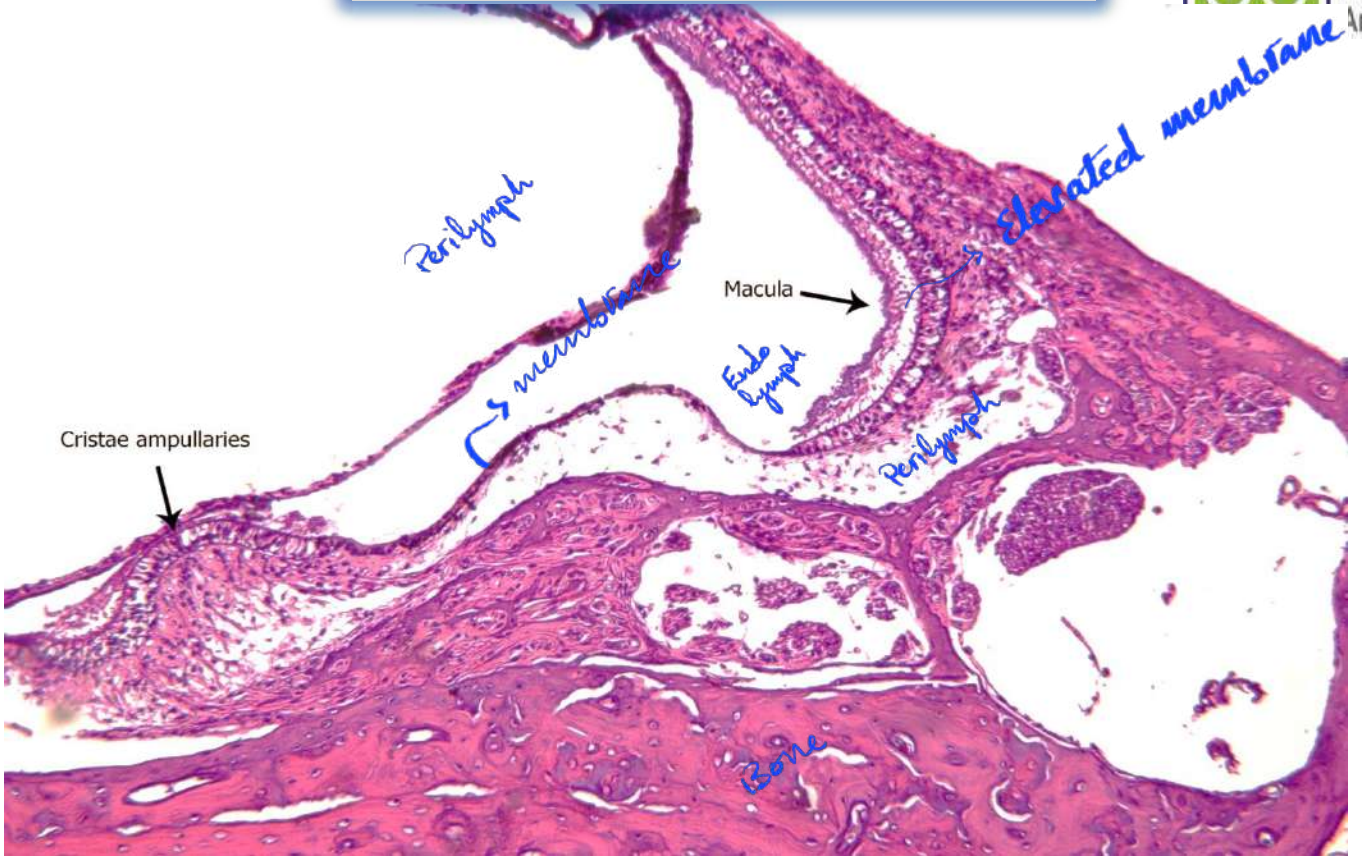

Macula

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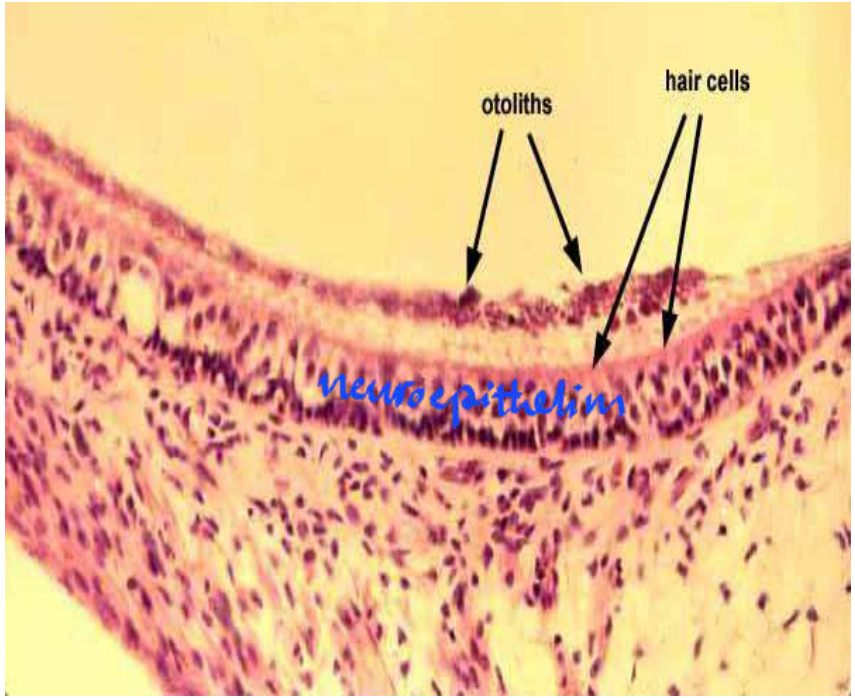

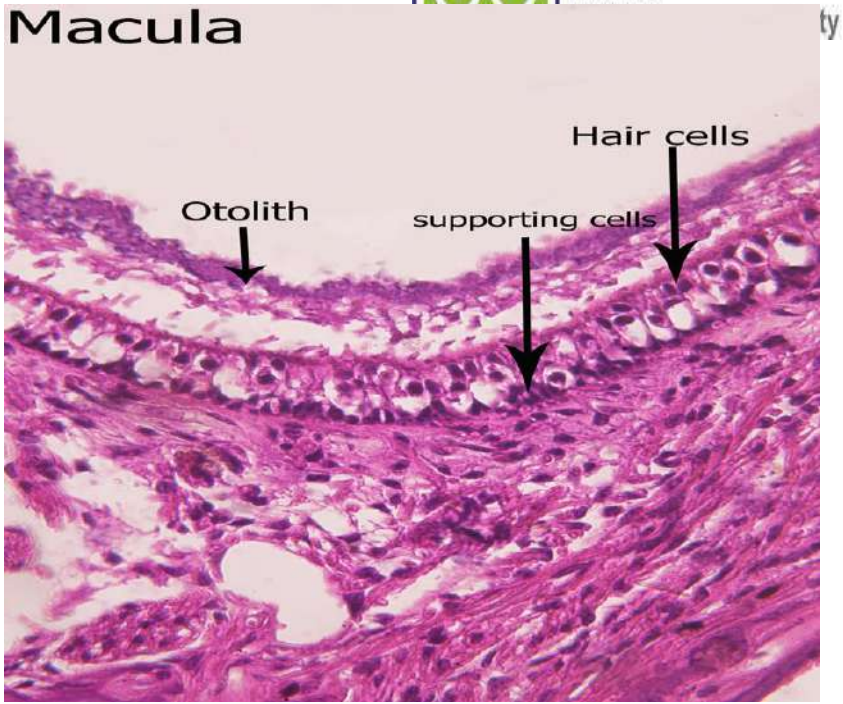

Macula

The sensory organ of linear (horizontal and vertical) acceleration in utricle and saccule.

Cristea Ampularis

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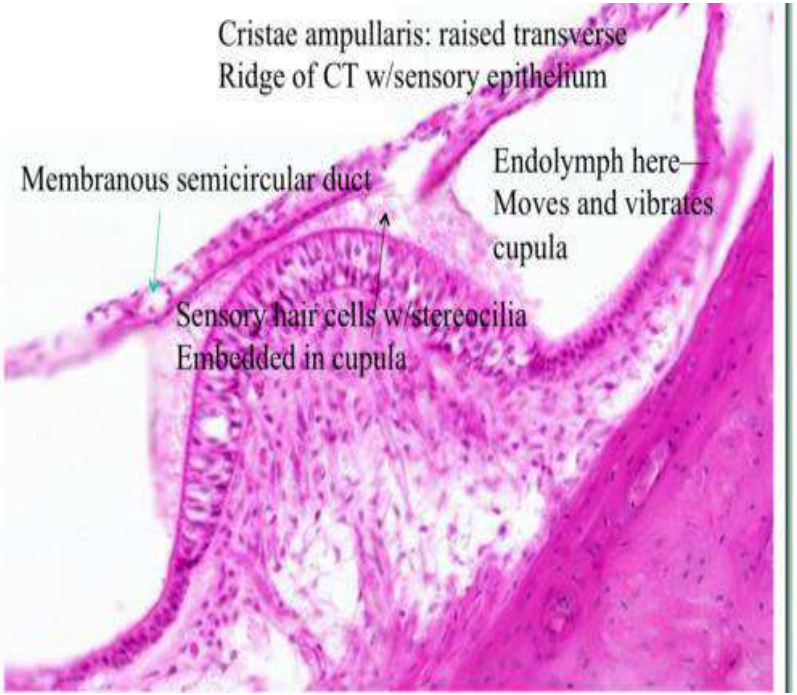

Crista ampullaris:

The sensory organ of angular acceleration (rotation) in Semicircular canals.

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Let's summarize ou r lesson for today

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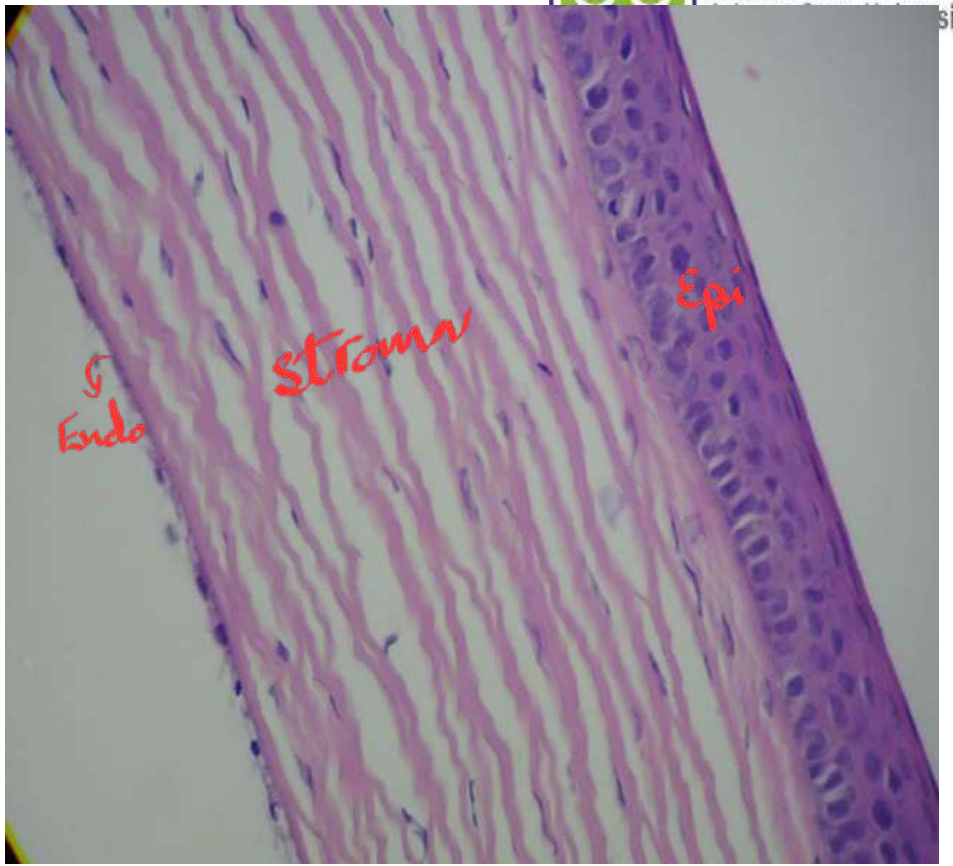
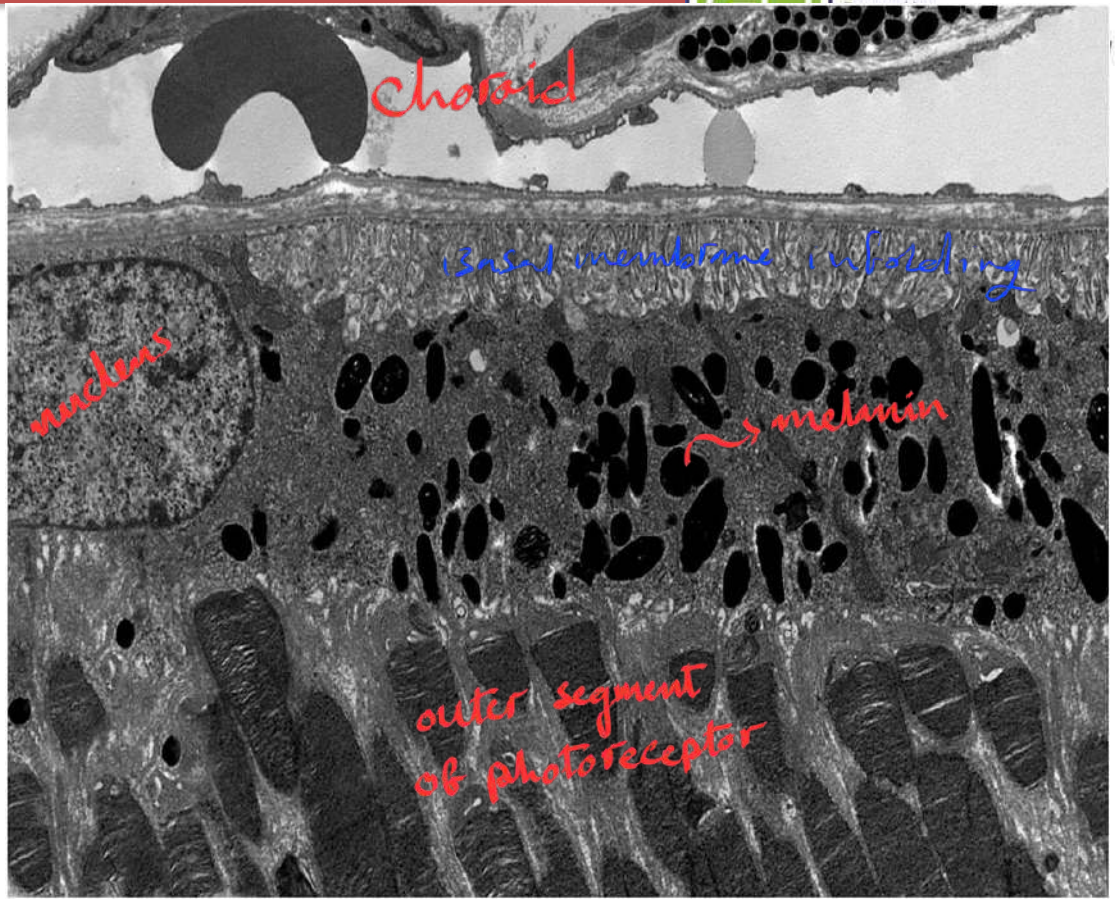
Cornea



Identify structure

The pigmented epit helium of retina and parts of photoreceptors



Identify structure

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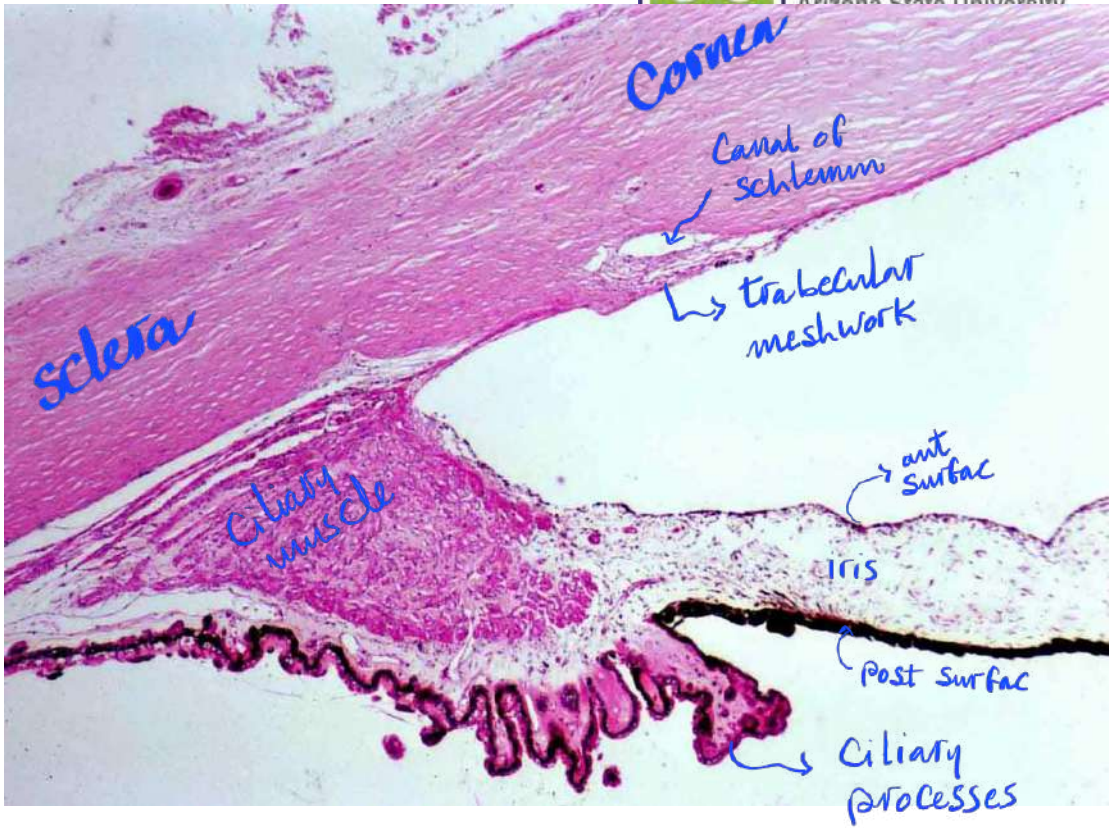
Corneoscleral junction



Identify structure

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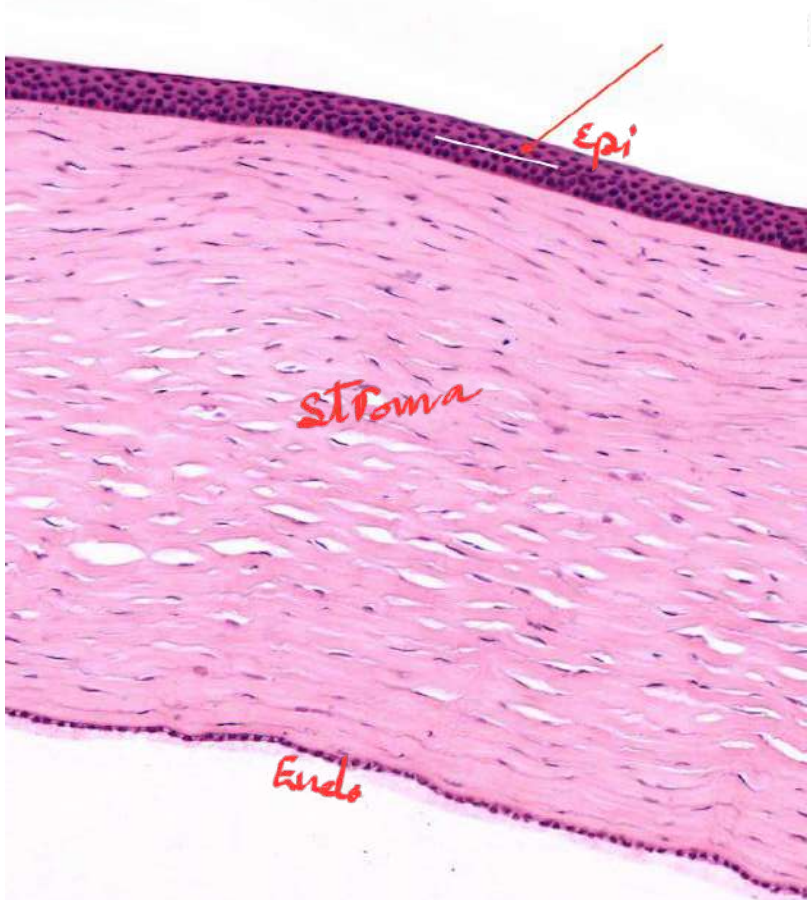
University

Cornea



Identify structure

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Maculae lutea &
Fovea centralis

Identify structure

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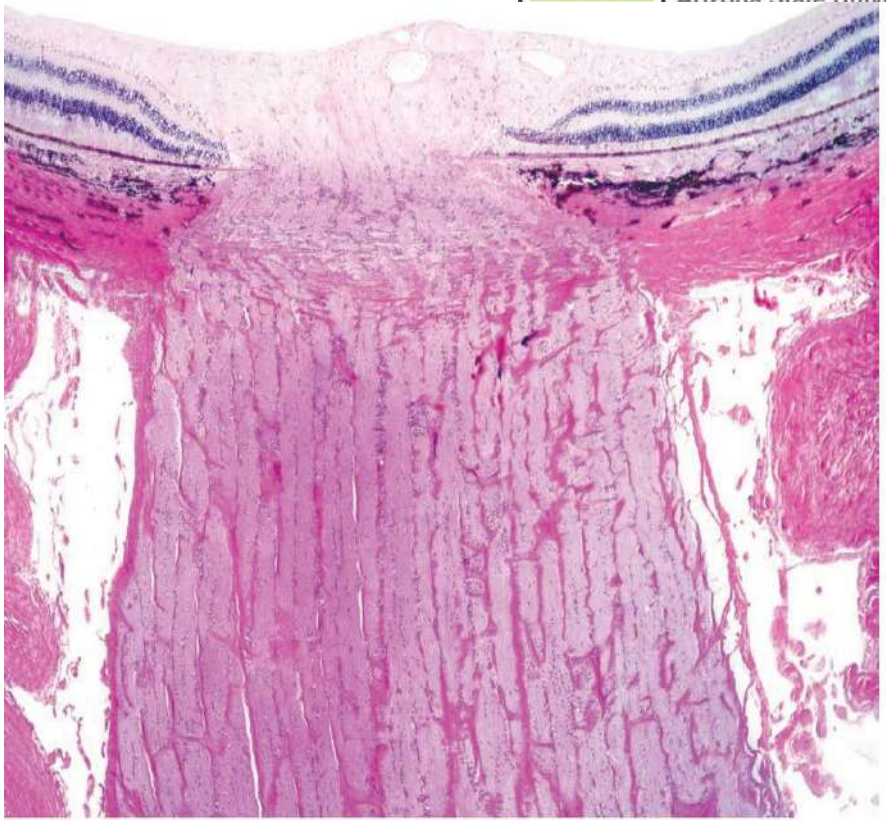
Optic nerve



Identify structure

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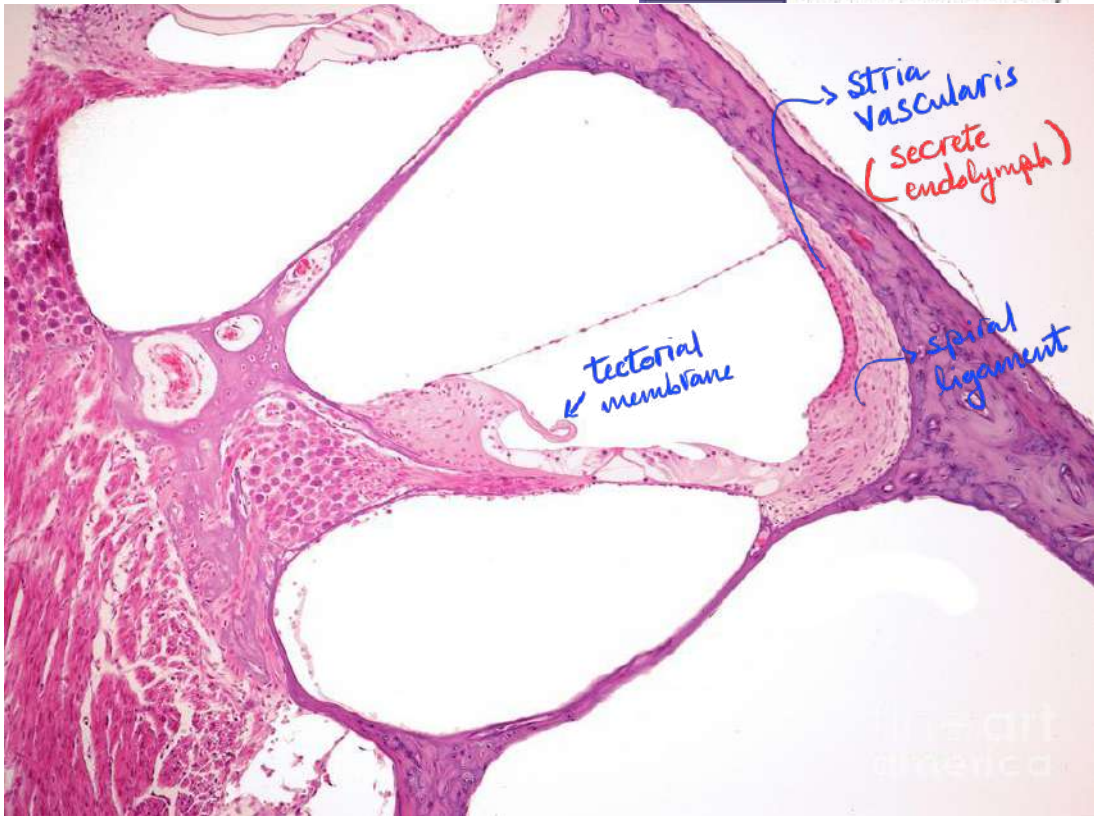
Cochlea



Identify structure

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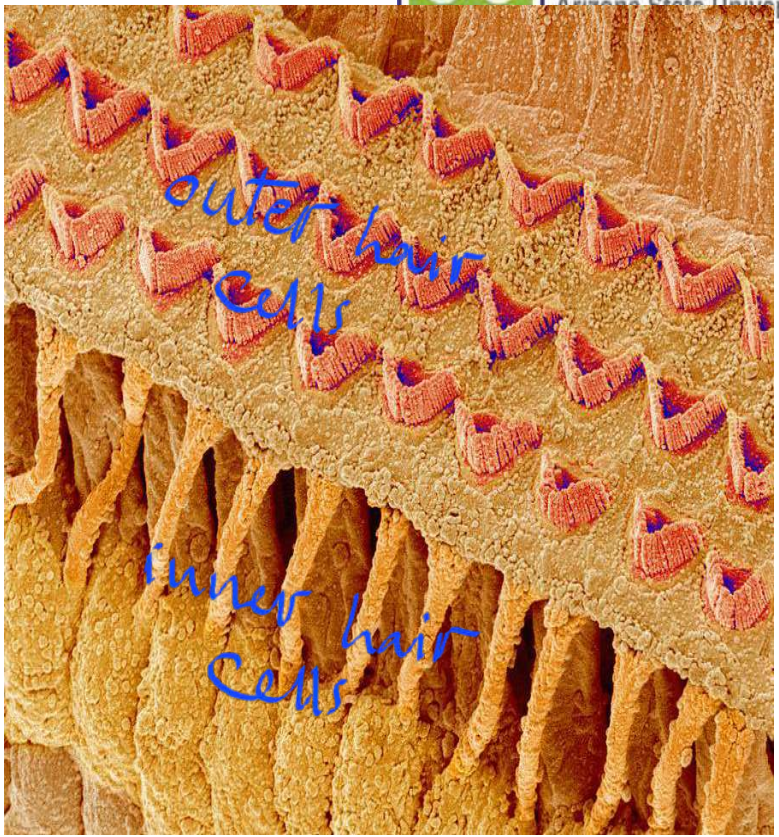
Hair Cells by SEM



Identify structure

Cochlea

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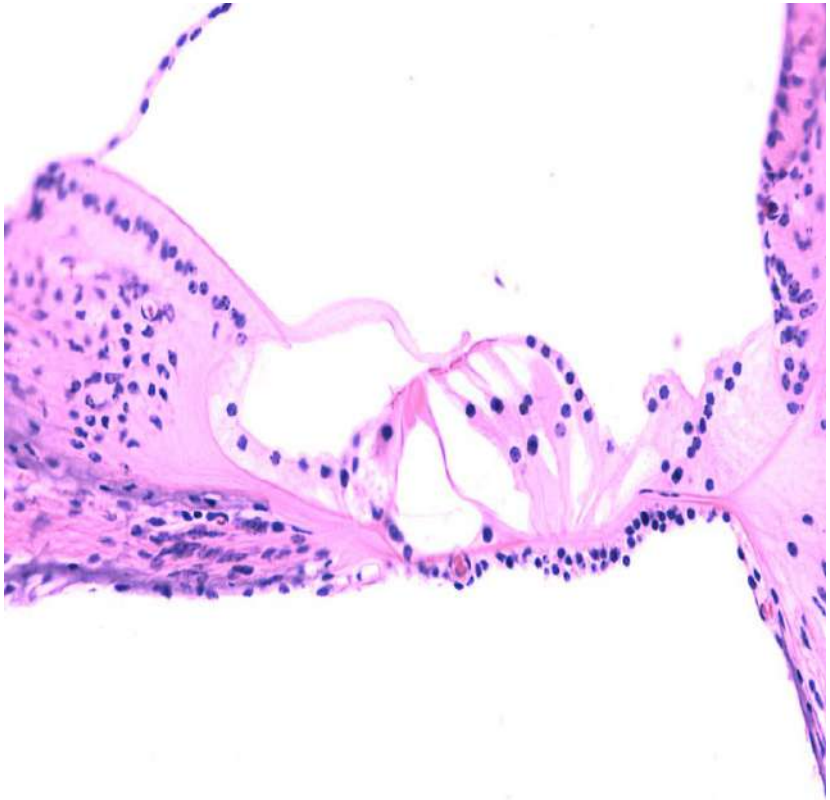

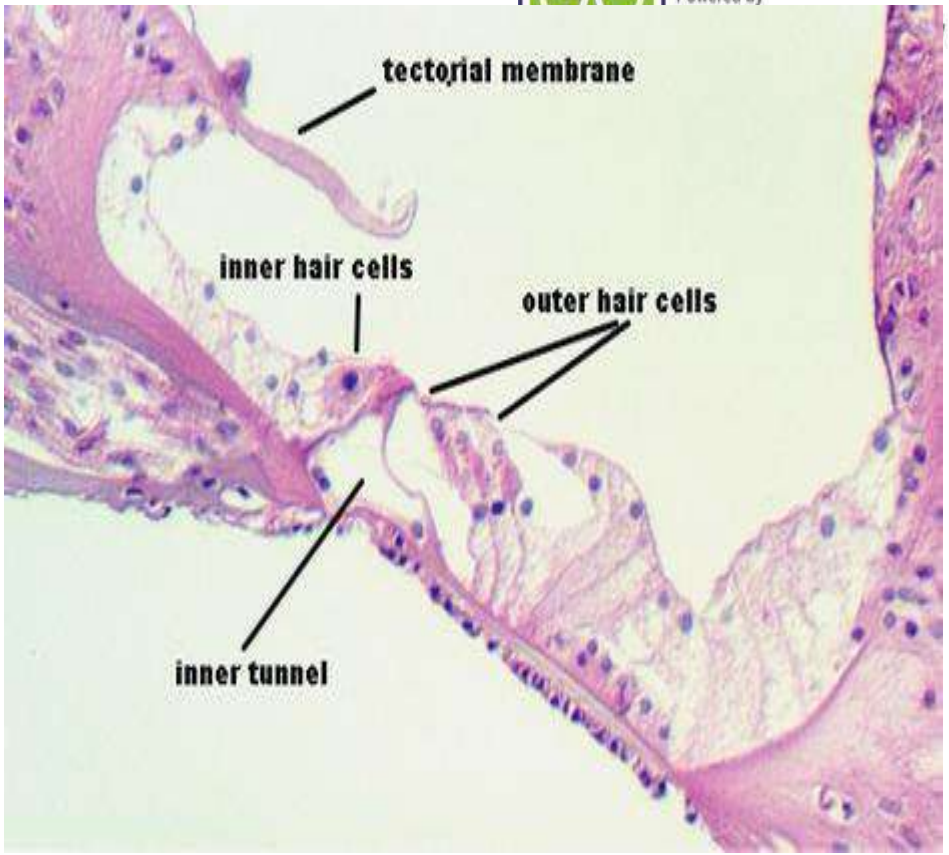

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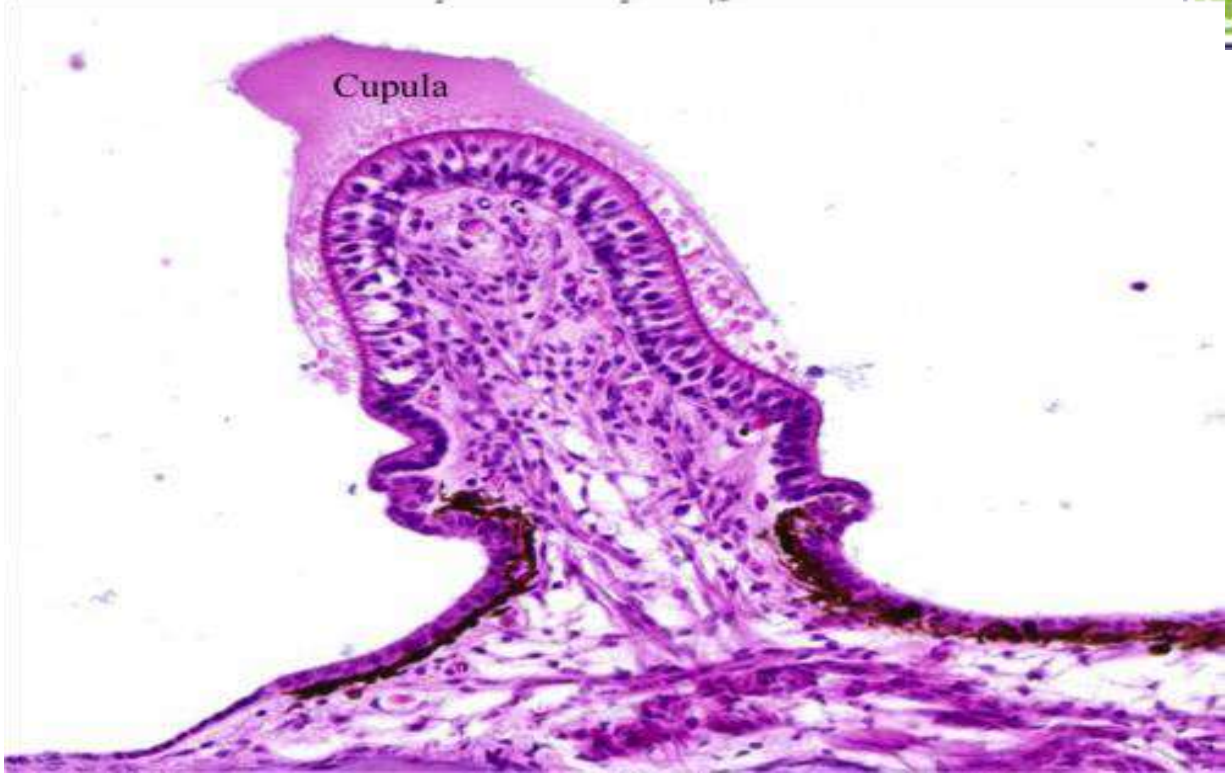
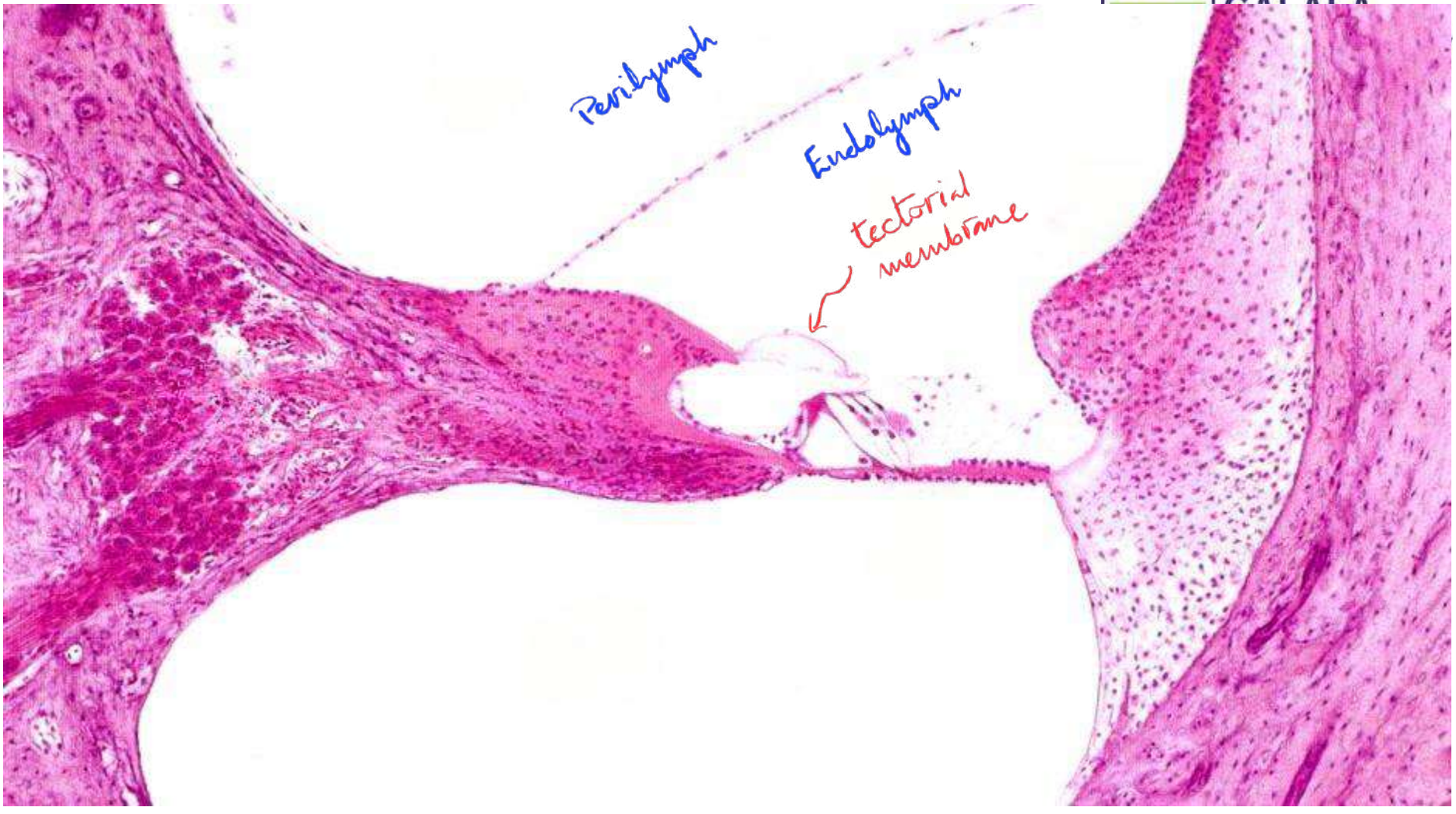
Cristae Ampullaris




Perilymph
Endolymph
tectorial membrane

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Thank you